

amateur radio

Vol. 39, No. 10

OCTOBER, 1971

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amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA. FOUNDED 1910



OCTOBER, 1971

Vol. 39, No. 10

Publishers:

VICTORIAN DIVISION W.I.A.
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Vic., 3002.

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Mrs. BELLAIRS, Phone 41-3535, 478 Victoria Parade, East Melbourne, Vic., 3002. Hours: 10 a.m. to 3 p.m. only.

Advertising Representatives:

TECHNICAL NEWS PUBLICATIONS
67 Victoria Parade, Collingwood, Vic., 3065.
Telephone 41-4962.
P.O. Box 191, East Melbourne, Vic., 3002.

Advertisement material should be sent direct to the printers by the first of each month.

Hamads should be addressed to the Editor.

Printers:

"RICHMOND CHRONICLE," Phone 42-2419.
Shakespeare Street, Richmond, Vic., 3121.



All matters pertaining to "A.R." other than advertising and subscriptions, should be addressed to:

THE EDITOR,
"AMATEUR RADIO,"
P.O. BOX 36,
EAST MELBOURNE, VIC., 3002.



ACKNOWLEDGMENTS: If you write to Federal Executive or to the Editor no acknowledgment is sent out unless you specially request one. Better still, for important items, send them certified mail.



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COVER STORY

The new Yaesu Musen model FTDX-401, which is basically similar to the FTDX-400/560 circuitry, with same p.a. output power. Front panel layout follows that of the FTDX-560. Features introduced in the new model include a noise blanker, c.w. filter, and a cooling fan attached to the p.a. section.

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Power: 13.5V. Nominal Negative Earth.
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1W., 1.2 amp. lo power;
Rx—150 mA.

Antenna: 50 ohm.
Size: 29/32" x 6-1/8" x 8-1/2".

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state, and after further development, the circuit in Fig. 4 was evolved.

A spare 6.3 volt winding on the transformer was pressed into service, thus enabling a bridge rectifier to be used. The output from this rectifier is filtered by a single 100 μ F capacitor and applied to the control circuit.

Transistor Q3 and its associated components provides the initial delay. The actual delay time can be varied by changing the time constant of the RC network in the emitter circuit of Q3. The 1 meg. 100 μ F combination in the original unit gave a delay time of 28 seconds. This may vary considerably, depending on the UJT intrinsic stand-off ratio of the actual UJT used.

If a variable delay time is required then the 1 meg. resistor could be replaced by a potentiometer and a fixed resistor in series. A 500K potentiometer (linear taper) and a 500K resistor gives a delay which is variable between approximately 15 and 30 seconds.

The control transistor Q2 is initially biased off by the voltage across the 2.2K emitter resistor. This voltage is obtained from the 9 volt supply via the 470 ohm resistor R3, and being greater than the forward bias obtained from the negative bias supply, the emitter-base junction of Q2 is therefore reverse biased.

After the required time has elapsed, a positive pulse is applied to the gate of SCR2 via the coupling transformer T2. This pulse triggers the SCR which remains conducting since the current through it exceeds the holding current.

With SCR2 now conducting, the emitter resistor of Q2 is effectively bridged, allowing Q2 to be forward biased. This condition allows a continuous signal to be applied to the gate of SCR1, thus switching on the high tension.

Should the bias to the linear amplifier fail, then the high tension is automatically removed. If the bias returns, then high tension is once again applied to the linear amplifier. Thus if desired, the negative bias to the linear amplifier could be used to control the high tension.

SCR1 and SCR2 could both be of the cheaper 400 volt type such as the C106 Y1 or BT100A 500R. SCR2 need only be of low voltage rating and a BTX18 100 or CR1 051 C would be suitable. It is suggested, however, that any SCR with the required ratings which may be on hand could be tried.

The control transistor Q2 can be either silicon or germanium and of almost any type. A silicon type BC178 and a germanium type OC74N have both been tried in this unit with success. 2N1671 type UJT transistors were used in this circuit, but other types could be tried.

Transformers T1 and T2 in the original unit were 600 ohm c.t. to 8 ohm output transformers of the type used in transistor radios; T1 using only half of the tapped winding. However, before using this type of transformer in the position of T1, it would be advisable to check the primary to secondary insulation.

If necessary, the transformers could be wound on ferrite pot cores. The size of the pot core is not important and

transformers have been wound successfully on 18 mm. and 20 mm. cores.

A turns ratio of approximately 1:3 was required for T1 and 1:10 for T2. It may be necessary to experiment with the turns ratio depending on the actual components used.

A starting point for T1 would be 100 turns and 300 turns of the largest gauge of enamel wire which will fit on the bobbin. Similarly, 100 turns and 1,000 turns could be tried for T2.

To test the "Sentinel," the value of the series resistor Rx must first be chosen to give between 0.5 and 1 volt across the 10K resistor in the base circuit of transistor Q2. For 100 volts bias, Rx would be approximately 500K. With the unit switched on, and resistor R2 bridged out, SCR1 should trigger and high tension obtained from the power supply. If no output is ob-

tained, T1 may be incorrectly phased and either the primary or secondary connections should be reversed and the unit tried again.

Once the triggering of SCR1 has been achieved, the bridge can be removed from R2 and the time delay checked. Once again, if the time delay is found to be inoperative, then it is likely that the phasing to T2 is incorrect.

It is recommended that the bias control voltage for the unit be obtained from a point on the linear amplifier itself rather than from the power supply. Thus if a fault develops between the power supply and the linear amplifier, it is sensed by the unit and the high tension is quickly removed.

Lay-out is not critical and the unit can be constructed to suit individual taste and the amount of room available on the power supply chassis.

NOTES ON THE R.F. BRIDGE

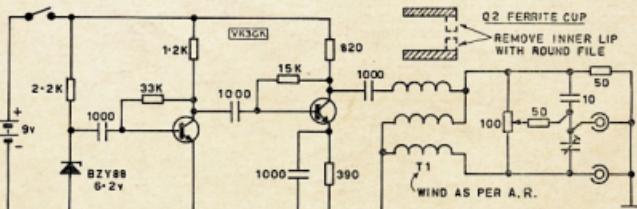
Modifications and Tips on Building the R.F. Bridge

See page 12 of "Amateur Radio," July 1971

I was so pleased with this article, and having used noise bridges in the past, I built this one straight off. However to make the device work satisfactorily in this country there are a number of tips which should be passed on fairly quickly so that the dustman will not be removing loads of defunct transistors from the VK Amateur shacks.

Briefly, I recommend changes as follows:-

1. Revise the amplifier circuit to use capacitive coupling between the transistors.
2. Increase the collector load resistance to 1.2K for Q1, and 820 ohms for Q2. This gives more gain from the amplifier. The 47 ohm load on Q2 in the original, I think, is a mistake.
3. Q2 is biased with 14K from collector to base.
4. Coils may be wound on modified Q2 material ferrite cups designed to go around Neosid miniature slug tuned coil formers which are readily available in Australia for less than 5 cents each. Simply file out the internal lip at the top, leaving a uniform cylindrical torroid. The resultant transformer is wound as per the article and works from 1.8 to 50 MHz.



THE REVISED R.F. BRIDGE CIRCUIT

A BIT OF LIGHT NONSENSE

J. L. SINCLAIR,* VK8ZSJ

Does the atmosphere affect light in the same way as it causes "reflection" of v.h.f. signals? Obviously the atmosphere does affect light quite markedly at times, hence mirages, but the problem is to decide whether the action is the same in both cases.

Some time ago I lived in a spot that had been selected for its view, an expanse of Adelaide's southern suburbs and Gulf waters with Yorke Peninsula some times visible on the horizon. It was a good spot for v.h.f. DX, too, although I must admit I did not make full use of it. I had often wondered whether the atmosphere would affect light in the same way as it caused "reflection" of v.h.f. signals. Obviously the atmosphere does affect light quite markedly at times, hence mirages, but my problem was to decide whether the action was the same in both cases.

Preliminary thought about the subject led me to several conclusions, such as:

(a) Propagation of v.h.f. is not normally a reflection?

A true reflection will have the characteristics of the normal h.f. bands such as skip zones, propagation over long distances with very little loss, and fading due to multi path working. The normal v.h.f. signal exhibits none of these characteristics and so I venture to suggest that most so called DX working (150-300 mile range) is by a type of refraction in the lower atmosphere rather than by the more commonly accepted theory of tropospheric inversion layers. I have no doubt that inversion reflections do occur, but they account for the very much rarer path of 400 to 800 miles.

(b) Weather conditions that cause mirages occur much too rarely to be the same effect as causes v.h.f. DX but it was possible that a bending effect may be observable that could be correlated with radio propagation over a particular path.

(c) The exact nature of refraction had to be understood. I had to sit down and explain it to myself along the following lines:-

(i) Huygen's Principle says in effect that a wave motion will always travel at right angles to the plane of the wave front.

(ii) Refraction occurs when a wave hits a medium of different density at an angle and is therefore slowed on one side of the wave front more than the other. In fact when you work it out light does not really travel in straight lines so much as it passes between any two points along the path that takes the least time.

(iii) A definite surface is not really necessary for refraction, a wave front travelling in a medium with any sort of uneven slowing effect will be refracted so long as it is not travelling exactly at right angles to the graduation.

(iv) Such a graduated medium exists in the atmosphere merely by the fact that air pressure is greatest near the ground and shades off eventually to nothing. A wave travelling parallel to the earth's surface will be retarded more by the denser air near the ground and so will always normally have a tendency to dip towards the surface of the earth.

(v) What is important is the pressure gradient which is sometimes less marked than normal, but quite often, more than normal at very low altitudes (up to 200-300 ft. above ground level). The books say that on cloudy, windy nights the gradient is least because the atmosphere is all more or less at the same temperature and on still sunny days for instance the pressure can change quite rapidly with heights for the first few hundred feet.

This was where my perch on the hillside started to appear useful. It seemed to me that the horizon we saw 40 odd miles away should move up and down very slightly with changing weather conditions.

I used the rifle sight principle to prove that it did in fact happen that way. One "sight" was a bolt on the t.v. aerial (it shows the "monster" is useful for something!), and the other was a graduated scale I attached to my antenna tower 50 odd feet away. Graduations were to the nearest minute of arc and I found a variation of up to 10 minutes between maximum and minimum readings. Later I moved the sight to a pair of posts the same distance apart because the t.v. aerial seemed to be a bit too flimsy for such a thing, but got substantially the same results.

After taking readings of the position of the horizon for most of one summer, I went looking for radio signals to compare them with. Two series of records of real use that I found were contacts between Mick VK5ZDR and Herb VK3NN, and signals from Mick and George VK5GG to Jim VK5ZMJ. Several other people round the Adelaide area were able to give me reports that filled in gaps in the series. From the figures I was able to prepare graphs of:-

- (a) Height of the horizon on each day;
- (b) Signal strength over the path VK5ZDR to VK3NN on each day;
- (c) Signal strength over the path VK5ZDR to VK5ZMJ.

Since VK5ZDR had been by far the most consistent, I used other peoples' reports to fill in gaps that occurred,

reducing all reports to the signal strength that VK5ZDR would most probably have given in the circumstances.

Gaps in the graphs were many and varied, but there were about 40 points in the western path and about 20 points in the northern path that could be used to test my theory that v.h.f. radio and visible light would be similarly affected by day to day weather conditions.

With a book of instructions on statistical methods in one hand and a pencil in the other, I started preparing tables and testing the coefficient of correlation of each set of figures. My first try was to compare signal strengths on one path with that of the other. It yielded the disappointing figure of -0.093, which was not significant. Correlation coefficients are a measure of the chance of one quantity varying in step with the other; they vary between +1 and -1, the figure of +1 indicates that both quantities will always be in step, -1 means that as one gets bigger the other will always get smaller, and 0 or low numbers mean that the two are not really related to each other.

Since the weather in South Australia comes from the west and moves to the east, I reasoned that the reports from the northern path may correlate better with reports from the eastern path at a later time, so I tested a series of tables with respective time differences of 12, 24, 36 and 48 hours. The results I got were:-

Time Difference	Correlation Coefficient
0 hours	-0.093
12 "	+0.255
24 "	+0.066
36 "	-0.001
48 "	+0.079

The best estimate I can make of these figures is that all except the 12-hour difference figure are not related and the 12-hour figure is only slightly probable. None of the results showed a high enough correlation to allow me to combine the two sets of results.

My next sets of figures concerned a comparison between the path to VK3NN and the horizon measurement. In this case there were several occasions when Mick had recorded contacts on 432 MHz, as well as on 2 metres. In this case, I wished to give some weight to the 432 MHz. conditions so I divided the "S" number given by four and added it on to the "S" number recorded for 144 MHz. The graph I made was of this composite "S" number with some other minor changes when conditions were obviously exceptional. In the same way as before I worked out cor-

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relation coefficients for the two for a number of different time delays and obtained the figures as follows:—

Time Difference	Correlation Coefficient
Signal 24 hours before h.m.	-0.378
" 12 "	+0.236
" at same time as "	+0.028
" 12 hours after "	+0.186
" 24 "	-0.469
" 36 "	+0.040

(Without abbreviations: Radio Signal 24 hours before horizon measurement.)

There was, however, one other trick that I tried. I made graphs of correlation coefficient in each case against time difference. The results shown elsewhere looked to me like a sine wave with a heavy second harmonic content so I attempted to fit them to such a thing. In the case of the graph concerning the western path, I found that by moving every sound point a distance of 0.4 in the positive direction, I got a promising fit to a curve of about $2\frac{1}{2}$ days' wavelength and a peak to peak distance of 0.48. I then calculated closer approximations and ended up with a quite presentable graph.

I use an electrical analogy to make mean something to myself along the following lines. Taking the state of certain yes (correlation +1) as one volt positive, and the state of certain no (-1) as one volt negative, I find that the curve has three components:

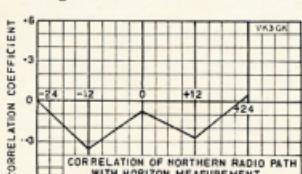
- (a) A d.c. component of 0.035 volts negative;
- (b) An a.c. component with a wavelength of 24 hours and amplitude 0.383 volt peak to peak;
- (c) An a.c. component with wavelength 56.5 hours and amplitude 0.508 volt peak to peak.

I worked the same procedure with contacts to VK5ZMJ although in this case there were no contacts on 432 MHz. and no other really unusual circumstances. The figures I obtained were:—

Time Difference	Correlation Coefficient
Signal 24 hours ahead h.m.	+0.007
" 12 "	-0.357
" at same time as "	-0.081
" 12 hours behind "	-0.269
" 24 "	+0.042

(Without abbreviations: Radio Signal 24 hours ahead of horizon measurement.)

The book had directions for testing the significance of these results and to the best of my knowledge it seems that most of the results are not significant, but a few of the higher ones probably are. The highest figure (-0.469) was only possible by chance once in about 200 to 300 times. The accuracy of the result increases with increasing numbers of trials and in this case there were 35 reports that could be compared. Other figures were:—

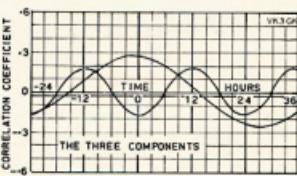


(a) When the western radio path was compared 24 hours before horizon measurement it gave a figure of -0.378 with 31 comparisons which had one chance in twenty of being random occurrence;

(b) When the northern path was compared 12 hours before horizon measurement it gave -0.357 in 18 trials which could have happened by chance once in about five times.

All the other measurements were less significant and therefore not worth talking about as they stood.

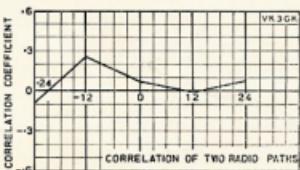
pass judgment on this point and also the significance of my method of fitting the correlation graphs to a pair of sine waves. One point I am fairly sure of is that the figure -0.469 is too high to have occurred by pure chance and requires some explanation, but just what it means has me tricked.



There was another thing I noticed. A smoky line on the horizon about a quarter of a degree wide and up to half a degree above the actual horizon. I believe it could have been some sort of mirage of the sea and it was recorded on the following dates: 23rd October, 1966, 18th February, 1967, 19th February, 1967, and 12th March, 1967.

My records show exceptionally good radio conditions on 23rd October and 18th February, unusually poor but not hopeless on 19th February and average on 12th March. I am not sure what it was in each case that caused me to record exceptional conditions on these days, but it was such things as VK7's worked into Adelaide or stations working westward from under the shadow of the Mt. Lofty ranges, all effects I regard as probably due to tropospheric reflection.

The dates on which such events occurred are also of interest, they were: 23/10/66, 15/11/66, 25/12/66, 7/1/67; 9/1/67, 20/1/67, 18/2/67, 7/3/67, and 29/3/67.



In this case the errors of the respective points are:

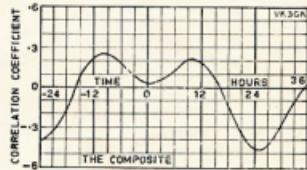
1st point	0.020 (20 millivolts)
2nd "	0.000
3rd "	0.001
4th "	0.000
5th "	0.000
6th "	0.024

In the graph of the northern path, the figures are small for accurate calculation to be meaningful, but roughly it seems to me like a composite of:

- (a) A d.c. component in the range of 0.1 to 0.2 negative;
- (b) An a.c. component of 24 hours wavelength, amplitude of 0.247 peak to peak;
- (c) An a.c. component of 35 hours wavelength, amplitude 0.18 peak to peak.

After having done all these calculations I am left wondering just what, if anything, I have discovered. I had expected that the graph of correlation against time difference would have shown a strong positive peak in one spot at about 12 hours delay instead of the negative peak found. This would have tallied fairly well with the movement of weather patterns across South Australia.

I also wonder whether I am justified in making graphs of graphs and calculations as I have done, or whether the whole thing is just so much high sounding nonsense. I would like someone of good mathematical authority to



The time intervals between them are respectively: $23\frac{1}{2}$ days, 40 days, 12 $\frac{1}{2}$ days, 2 $\frac{1}{2}$ days, 10 $\frac{1}{2}$ days, 29 days, 17 days and 22 days. There appears to be a suggestion of repetition in these figures of a time period about 20 days or a little longer, or may be two trains of events at 40-day intervals, for instance 10 $\frac{1}{2}$ and 29 make 39 $\frac{1}{2}$ days, 17 and 22 make 39 days, and one 40-day period occurs. I think what I am suggesting is that weather patterns conducive to v.h.f. DX are capable of persisting long enough to make a complete circuit of the globe and take either twenty or forty days to do it (I am not sure which). The circumference of the earth at the latitude of Adelaide is 20,480 miles, which means that a speed of 500 to 1,000 miles per day would be required. Of the two,

(Continued on Page 11)

The Solar Link*

R. A. HAM, F.R.A.S.

INTRODUCTION

The sun, like many other stars, is a nuclear furnace consuming enormous reserves of fuel and radiating energy in many forms. The apparent yellow disc on its surface, the photosphere, has a temperature of around six million degrees, and it is surrounded by a gaseous atmosphere, the corona, which extends a million miles into space and has a temperature of one million degrees. Periodically, dark patches appear on the photosphere; these are called sunspots and are some 2,000° cooler than the surrounding photosphere. Some sunspots are scarcely visible and have a short life, while others are measured in thousands of square miles and can survive a full 27-day solar rotation. Radio energy from the sun may be detected by a radio telescope; when the sun is "quiet" the radio noise detected is of thermal origin and will get stronger as the observational radio frequency is increased from 30 to 10,000 MHz, and the sun is classified "active" when sunspots are present.

The latter are usually accompanied by solar flares that look like great arches of flame when seen through special optical instruments. Very large flares are called prominences, and in July 1946 an event like this raged across 500,000 miles of the sun. Solar flares can be heard on earth with radio instruments 8.3 min. after they originate on the sun, but the particles that are ejected at the time of the event can take up to 40 hours to reach our planet. The radio frequency for detecting solar bursts and noise storms is between 30 and 300 MHz, with a peak around 150 MHz.

The sun can develop a spot at any time and produce the activity which goes with it, and the prime object of this article is to show how the sun can disturb the earth's atmosphere and consequently the earth's radio communication. Another object is to emphasise the need to record the effect of natural manifestations which take place and to send reports on them to R.S.G.B. and other organisations.

OBSERVING SOLAR ACTIVITY

The author's radio telescope was established on 1st June, 1968, to observe the midday sun from 1130 to 1330 GMT daily, using a frequency of 136 MHz, with a bandwidth around 10 KHz. The observations are recorded at a high chart speed of 30"/hour so that detailed information can be gathered from the 5 ft. of chart used during a normal midday observation.

The radio telescope can observe the midday sun whether the sky is overcast

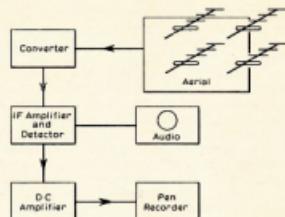


Fig. 1.—Block schematic of the author's radio telescope. The aerial is a home-built 4 by 4 element Yagi mounted on a 10 ft. x 6 ft. wood frame ½-inch wire mesh reflector.

The converter, mounted on the aerial reflector, is also home-built, transistorised, and operates from 32v., using AF170, mixer AF139, xtal osc. 36.066 MHz, and multiplier to 10 MHz, both AF139. I.F. output is 28 MHz.

The i.f. amplifier is an AR88 communications receiver tuned to 25 MHz, which also provides detector and audio output.

The d.c. amplifier is a 709 integrated circuit, powered by 9-0-9v.

The pen recorder is an Evershed & Vignoles 0.5 mm.

or not, and the author's XYL checks the solar image for sunspots daily if the sky is clear by projecting the sun through a 7 x 50 mm. gunsight and producing drawings as shown in Fig. 2. (Warning: never endanger your eyesight by viewing the sun directly through any optical instrument, always project the image.)

It was obvious from the very early recordings that the instrument would distinguish between the individual solar burst which may last a few minutes and the continuous noise storm lasting several days. As time went by this ability to separate and identify the two events proved most valuable when making reports to the British Astronomical Association and the R.S.G.B.

An individual solar burst, illustrated in Fig. 3, is less likely to strike the earth's atmosphere because of the time lapse between the origin of the event and the particles reaching the earth, by which time the earth has moved further along its orbital path. On the other hand a long series of individual bursts or a continuous noise storm lasting several days must bombard the earth's atmosphere somewhere. Contact with the earth's atmosphere by a huge stream of solar particles can cause an aurora at either of the earth's polar regions, and a particle stream can also disturb the Appleton layer of the ionosphere and cause a temporary total loss of h.f. band radio signals, known as a Dellingler fade-out.

The author has observed many examples of solar activity and the consequent disturbance to the earth's atmosphere and has selected two of these examples from his records.

Solar recordings for 1st March, 1970, showed several large individual bursts which sent the pen full scale, plus a slight increase in the general noise level. Solar recordings for the 2nd and 3rd were similar to those of the 1st, but with a lower burst amplitude; by the 4th a full scale noise storm was in progress which died down on the 5th. Many individual low amplitude bursts were recorded on the 6th and 7th. The

climax of this period of solar activity was the great aurora on 8th March which was fully reported by Ray Flavel in the September 1970 issue of "Radio Communication" and by the author in "Electronics Weekly" of 29th April, '70.

The second example came when a mammoth sunspot appeared on the photosphere around 11th November, 1970, and remained there until the solar rotation carried it out of view on the 21st. On the 12th the radio telescope showed a marked increase in the solar noise level and the polar diagram of the telescope aerial could be seen on the chart. By switch-on at 1130 GMT on the 13th, a noise storm was raging on the sun, getting stronger on the 14th and giving almost full scale deflection on the 15th. The solar noise was so strong on the 16th that the pen was at full-scale deflection for the whole period of the observation, and this was repeated on the 17th and 18th. On the 19th the noise was three-quarter scale; on the 20th down to half scale; and on the 21st a few tiny bursts above the receiver noise level. The earth's atmosphere was bathed for 10 days in solar ejected matter and according to reports there were three Dellingler fade-outs on the 15th and 16th—from the author's observations the atmospheric noise level was very high after sunset on the 16th.

Two examples do not do justice to the value of a solar radio telescope, but they will explain what happens at the time of solar activity and the events which can follow.

THE IONOSPHERE AND THE TROPOSPHERE

Terrestrial radio communication relies upon two regions of the earth's atmosphere named the troposphere and the ionosphere, the former occupying the first 10 miles above the surface and the latter extending from 40 to 200 miles above the earth. (See propagation section of the Radio Communication Handbook for details of atmospheric reflection of radio signals.) The Heavyside (E) layer of the ionosphere forms at sunrise and disperses at sunset, but sometimes solar activity will cause the E-layer to form or break up into patchy clouds of dense ionisation. This latter phenomenon, called Sporadic-E, will be known to the users of the 4 m band when its normal peace is disturbed by Continental broadcast stations which use the band nearly 1,000 miles away.

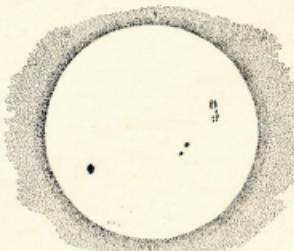


Fig. 2.—Sunspot drawing.

Although Sporadic-E is rarely evident above 100 MHz, on 4th July, 1965, an extensive cloud of dense ionisation centred over Europe influenced the 2 m band, and it was fortunate that a 2 metre contest had just started and many U.K. contestants were able to work the Hungarian station HG5DKQ/P and gain the points for a 900-mile contact. Had it not have been for the contest this rare Sporadic-E opening might have gone unrecorded.

A typical large Sporadic-E occurred on 6th July, 1970, when at 0700 GMT a considerable number of Continental stations could be heard between 30 and 50 MHz. By midday the E-layer disturbance had spread its influence to the B.B.C. fm. broadcast band and at 1430 GMT the author counted 14 Continental broadcast stations audible between 88 and 98 MHz. At 1900 GMT there was the usual interference to B.B.C. band 1 television and a large number of long distance sync pulses around 50 MHz. The 4 m U.K. amateur band was impossible to use owing to the strength and bandwidth of the Continental broadcast stations. At 2045 GMT the reflecting E-layer made another change and the prevailing chaos stopped abruptly. Suspicious about this sudden end to an E-layer disturbance, the author turned his 4 m beam northwest and for the following hour heard the 599 signal of the Icelandic beacon TF3VHF on 70.275 MHz.

Line-of-sight v.h.f. signals above 100 MHz, rely for their path on the prevailing conditions within the troposphere, which is the home of the earth's weather and this can be very hostile to v.h.f. radio signals. Apart from the attenuating effect of the weather itself, there is the thunder static which can ruin reception.

The accepted range of a v.h.f. signal under normal tropospheric conditions is between 50 and 100 miles, but under abnormal tropospheric conditions this range can be multiplied by 10. The reason for this has been the subject of many articles in "Radio Communication," and over the years the author has noticed that when the atmospheric pressure is above 30 in. and then rises again, there is a good chance of a tropo opening at the point when the pressure starts to fall. Typical examples of 2 m openings coinciding with the pressure falling are the contests on 4th-5th March, 1967, when the band was open from GW to DJ, and on 20th November, 1967, when a two-day opening brought signals from OZ to the south of England. There was a four-day tropo opening in March 1969. In May 1970 a sudden pressure drop in the

final hour of a 2 metre contest brought up the signal of HG9AEN/P. Another large tropo opening took place in November 1970.

The author conducted a three-month experiment starting on 1st June, 1969, during which the atmospheric pressure and the signal strength of GB3GW, 130 miles away, were recorded three times a day. A graph at the end of the observation showed that the signal strength of the R.S.G.B. Swansea beacon came up just before the pressure was due to fall.

The troposphere can change its condition at any time, so it is vital to have a permanent signal to observe, and the R.S.G.B. has fulfilled this need by providing several 2 metre beacons. With knowledge of the terrain between himself and the beacon an observer can tell the extent of the prevailing tropo openings, and without the beacons the v.h.f. bands for some periods would be written off as unusable. Two metre contests are very important to tropospheric studies; in addition to the personal satisfaction gained by the entrants, the contest logs are a record of v.h.f. activity and when analysed can have considerable scientific value.

SOLAR ACTIVITY AND THE WEATHER

The routine work at the author's station includes checking the 4 and 6 metre bands for ionospheric disturbance, recording the atmospheric pressure, noting the prevailing weather and checking the 2 metre band for tropospheric openings. As the daily records of solar, atmospheric and weather events were accumulated it became apparent that a new factor was emerging from them. It was seen that a relationship existed between certain types of solar activity and severe weather conditions.

Until recently the author, like many other people, was sceptical about the sun disturbing the earth's weather, despite scientific literature quoting climatic changes at the time of peak sunspot activity. But general opinion suggested that a positive connection between the sun and the earth's erratic weather had yet to be found.

To look for this connection in the station's records it was necessary to extract the solar and weather information, and to get a definite meaning into the extracted data the author decided to classify both the daily solar and weather observations into two states, active or inactive, and make a comparative table from the results. The sun was classified as active if some form of solar output appeared on the daily

recording charts, while the weather was classified as follows:

Inactive: Sunny, cloud, overcast, fog, frost, mist.

Active: Wind, rain, gale, snow, blizzard, thunder.

The classified sun/weather log kept from 1st June, 1968, to 30th April, 1971, produced the following set of figures:

Observation period: 1,064 days.

Sun active: 610 days.

Local weather active: 402 days.

Sun and weather active: 253 on the same day.

Taking a general view of this 1,064-day period one can see that the coincidence of the sun and weather being active on the same day is 253 out of 402 (62.9 per cent.), which from these figures one could expect. It is obvious that when other factors, such as solar activity outside the author's observation time and national plus international weather reports, are taken into account the percentage scale would alter considerably. However, the author believes that the type of weather classified in his records as active and observed from his station is representative of weather over a much larger area.

Major weather events reported by the national news media (not included in the station weather log) were noted when possible, and one can be sure that if they made national news they were something big. A closer study of the actual solar condition which coincided with these major weather upheavals revealed that a solar noise storm lasting several days was the main culprit, as the following four examples will show:

November 1970. A month of activity from both sun and weather. During the first five days many small bursts and a few large ones lasting several minutes were recorded, while the weather on the 2nd, 3rd and 4th was wind and rain. For the next six days both the sun and weather were intermittently active until the 12th when a severe solar noise storm started and carried on until the 21st. The local weather was wind and heavy rain from the 12th to the 19th, and the rainfall checked by the XYL was: 13th, 1.33"; 14th, 0.83"; 15th, 0.62"; 17th, 0.39"; 18th, 0.62"; and 19th, 0.11", making a total of 4.1" for the six days which coincided with the solar storm. The national news carried the story of the severe flooding in East Pakistan, and this again coincided with the solar storm.

December 1970. The first 16 days saw little activity from the sun or weather; the radio telescope recorded a few bursts and the calm weather was interrupted by occasional rain. On the 17th a solar noise storm developed and lasted until the 23rd, and on the 17th the weather went active. Wind and rain developed into a white Christmas with its snow, blizzards and extreme cold. The news media reported severe blizzards in Europe and that some countries had seen snow for the first time.

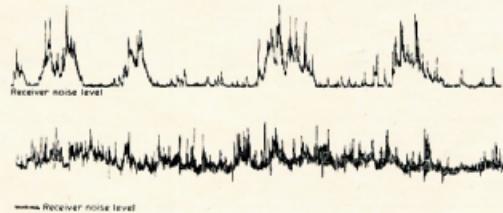
January 1971. The cold weather from December was carried into the new year. The end of the cold weather came on the 6th-7th, and a few days of wind and rain prevailed. The thaw coincided with the start of a solar noise storm which lasted until the 13th.

(Continued on Page 10)

Fig. 3.
Isolated solar
bursts.



Fig. 4.
Continuous solar
noise storm.



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THE SOLAR LINK

(Continued from Page 9)

Around the peak of this solar storm the news reported freak mild weather on the 10th throughout the U.K. with record January temperatures. The sun and the weather were unsettled for the five days which followed the solar storm, and on the 19th another noise storm started and continued until the 25th. During this solar storm the weather developed, providing heavy wind and rain, severe gales, and a whirlwind in south-east England; and on the 21st the atmospheric pressure recorded by the writer was down to 973 mb. A further solar noise storm broke on the 28th and ended on the 31st, and with it came very active weather. A windy day on the 28th preceded a calm 29th, but on the 30th wind, rain and snow prevailed throughout England and Wales. The news services reported floods in Poland and severe floods in Mozambique; Australia had 9" of rain in one day, and the River Thames was in risk of flooding owing to severe gales in the North Sea.

April 1971. There were two solar noise storms during the month. The first started on the 9th and ended on the 17th during which period the new U.K. to China h.f. telephone link was delayed by "atmospheric disturbance". The news service announced on the 13th that the monsoon in East Pakistan had started a month early. A B.B.C. news report on the 21st May about the Mount Everest expedition said that the weather on the 16th-17th April on the mountain had been the worst for 72 years. From the 18th to 24th there were a few solar bursts and the weather was mainly fine apart from rain on the 23rd. On the 25th the second solar noise storm started, and on the 26th there was rain, sleet and snow across southern England with roads blocked in the West Country. The news media reported the coldest April day since records started in 1940.

ACKNOWLEDGMENTS

The author would like to make acknowledgment to the R.S.G.B. for the beacon service and to the beacon keepers who ensure that a permanent signal is transmitted 24 hours each day. A word of praise also goes to the members who work in the I.M. contests, especially the portable stations which provide signals from exotic sites which are compared with prevailing atmospheric conditions; for the valuable work of members of the Scientific Studies Committee who ponder and advise on the observers' reports; and for Jack Hum who in Four Metres and Down in "Radio Communication," reports on v.h.f. activities.

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Development of an All-Band Vertical*

H. S. BROWN, G3RFG

On arriving at his present QTH the author found that the ground space available for the erection of aerials measured only 30 x 10 ft. and another restriction was that nothing that looked like a t.v. aerial was allowed. In order to get on the air a self-supporting mast that could be raised or lowered easily by one person was erected and it has since been used during many aerial experiments. As a result of these experiments it became obvious that what was required was an all-band vertical that produced low impedance at its base for all bands, and the result is shown in Fig. 1.

The aerial is made up of three lengths of aluminium tubing 12 ft. long, with 1/16" walls, and of 1", 2", and 3" diameter respectively. One end of each of the two thicker tubes is slit down for several inches and the three lengths are then spliced together, the joints being secured by two Jubilee clips. A triangular piece of thick Perspex is fitted between the top two clips, and three lengths of thin nylon cord are connected to it as guys to prevent movement of the top section of the aerial. An 8 ft. 3 in. length (quarter-wave on 10 metres) is cut from the lower 1" diameter section and the two resulting lengths are secured to the mast, one above the other and 2" apart, by stand-off insulators.

The 2" break in the aerial is then linked and a check made for resonance on the 40 and 15 metre bands. The link is then replaced by the coil and the taps adjusted for resonance on 20, 80 and top band. If an impedance bridge is used it will be found that it will indicate approximately 25 ohms on 40 metres and 35 ohms on 15 metres. It was decided to use two lengths of 75 ohm co-axial cable in parallel to provide the best match on 15 metres because of the greater output power on 40 metres from the author's transmitter.

On 10 metres the aerial can be used as a normal vertical; by removing the base feeder and connecting a length of 75 ohm co-axial cable to the junction it becomes a vertical dipole; and by earthing the lower section and feeding the junction with 50 ohm co-axial cable it becomes an elevated-feed three-quarter-wave vertical.

The earthling system consists of as many earth rods as possible connected together with thick seven-stranded copper aerial wire. It was also found

that t.v.i. could be decreased if a length of this earth-wire was run parallel with the feeder from the base of the aerial right back to the Z Match. The author's feeder is run underground as far as is possible.

Over a period of two years this aerial has proved a winner and it is only necessary to stand on a step ladder in order to change bands; by inserting the link or connecting the appropriate fly-leads from the coil which is attached to the mast by stand-off insulators.

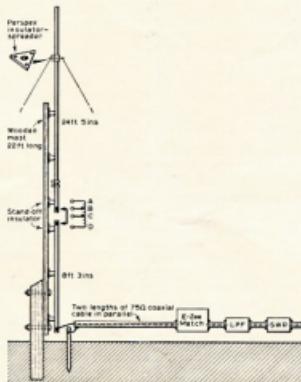


Fig. 1.

COIL DETAILS

It is recommended that anyone who constructs this aerial should use a g.d.o. to find the exact taps on their coils for resonance on the various bands, but the following coil construction details are supplied as a basis. A ribbed ceramic former of 2" diameter is wound with 55 turns of 20 s.w.g. tinned copper wire. The first 40 turns are spaced 1/10" apart, and the bottom 15 turns are close wound and enamel covered. Fly-leads are connected to the top, 22 turns down (for three-quarter wave on 20 metres), 29 turns down for 80 metres, and at the bottom for top band.

	S.W.R.	
Link out, Coil out	$\frac{1}{4}\lambda$ on 10 mx*	1:6
Link in	$\frac{1}{4}\lambda$ on 40 mx	1:1
Link in	$\frac{1}{4}\lambda$ on 15 mx	1:4
Coil in, A to B	$\frac{1}{4}\lambda$ on 20 mx	1:2
Coil in, A to C	$\frac{1}{4}\lambda$ on 80 mx	1:4
Coil in, A to D	$\frac{1}{4}\lambda$ on 160 mx	1:4

* On 10 metres the aerial can be used in two other ways:

- Disconnect the base feeder and use a 75 ohm feeder connected to the junction. This is now a vertical full-wave dipole. S.w.r. is 1:6.
- Earth the lower section and connect a 50 ohm feeder to the junction to make an elevated feed three-quarter wave vertical. The s.w.r. is 1:4.

A BIT OF LIGHT NONSENSE

(Continued from Page 7)

the smaller, corresponding to a 40-day period, is fairly close to the actual rate of progress of weather across the State.

There are no really definite conclusions to be drawn from all this. I don't regard the job as finished, but as a pointer to more exact experiments with better control of conditions. I think it is silly to say that if taken far enough it could lead to information as valuable as that on which the Ionospheric Prediction Service relies for its work. The subject should be an ideal one for somebody who wants material for a thesis and could be expanded to include comparison of propagation of different bands. As a first step, I should think the correlation would be very much higher for signals of different frequencies over the same path. Another refinement of interest would be to measure path loss against distance to find whether better conditions cause stronger signals over short distances at the same time as they cause the maximum distance of usable signals to be increased.

In conclusion, I offer my thanks to all who allowed me to search their log books and wish good hunting to anyone who can take this project a step further.



PROJECT AUSTRALIS REPORT

A.M.S.A.T. have now advised W.I.A. Project Australis that the frequencies to be used for the Australis Satellite are as follows:-

- VK Translators:
Uplink—145.80, 145.85, 145.90 MHz
Downlink—435.10, 435.15, 435.20, 435.25 MHz
- DJ Translator:
Uplink—To be decided.
Downlink—145.90 MHz.
- A.M.S.A.T. Translator:
Uplink—145.90 MHz.
Downlink—29.50 MHz.

The Australis-wide f.m. Repeater and Simplex channels in the 2 metre band are:

Repeaters—	In MHz	Out MHz
Channel 1	146.1	145.6 Secondary
"	2	146.2 Future
"	3	146.3 145.8
"	4	146.4 145.9 Primary

Simplex—MHz.
Channel A 145.824
" B 146.000 Primary
" C 146.146

The possible solutions to these frequency conflicts proposed by the Australis Group are:

- Changing the satellite channels.
- Changing the VK repeater channel frequencies.
- Turning off the VK repeaters during each pass of the satellites.

Solution (c) would appear, at this stage, to be the only practical way of solving the problem, as the satellite frequencies are an optimisation of frequency conflicts all over the world.

A modified "demonstration" version of one channel of the VK transponder will be sent to A.M.S.A.T. for testing on 20th August. If A.M.S.A.T. are satisfied that it meets N.A.S.A.'s rigid performance specifications, the Australis Group will begin construction of the flight unit.

The flight units of the A-O-B 60-channel r.t.t.y. telemetry system and the 35-channel command system are nearing completion and should be shipped to A.M.S.A.T. in Washington next month.

The launching of the A-O-B satellite will take place, it is hoped, about the middle of 1972.

—Richard Tonkin, Chairman,
W.I.A. Project Australis.

(All comments on the frequency conflicts listed above should be sent in the first instance to the Project Repeater Secretariat, C/o Tim Mills, VK2ZTM.—Ed.)

* Reprinted from "Radio Comm." August 1971.

Getting to know your Neighbour

HOWARD RIDER* VK3ZJY

On Sunday, 27th June—having been in Djakarta for two days—I decided it was high time that I met some of the Amateur fraternity. Armed with a simple name—K. W. Kwik—who lived at Djalan Maluku 52, which, according to my map, was close to the hotel in which I was staying, I set out not quite knowing where I would finish.

Finding the house was not as difficult as I had expected. A notice proudly stating this was the home of YB0CJ was well in evidence. In a very short time I was seated in the lounge room sipping tea and discussing common and specific interests of Amateur Radio with Kwik and his wife. The latter was not only interested but very knowledgeable in this field.

I learned of the general operation, various regions, regulations and examination procedure which will be described later. Besides being QSL manager for the Djakarta region (YB0), Kwik was also one of the Examination Officers, so my start could not have been at a better place.

A phone call and I was taken out to meet the President of the group—Suwondo (Wondo) YB0AT. He added to my already extensive set of notes and I learned that I had just missed an old friend, I. N. Dar (VU2BX), with whom I had spent many an enjoyable hour when living in New Delhi.

Many miles further on we visited the home of R. A. J. Lumenta Kaklum, YB0BY, whose call sign is a very well known one. I was a little surprised to learn that his wife was Secretary of the local group and more still when I found that she was YD0HV (Erica). Sidik (YC0DH) was also a visitor, so we all sat down together and had supper.

Coffee naturally was served in the "shack" where a couple of contacts were made with YB2AJ and a JA. This was an important occasion as they would be the last ones to be made in this country for fourteen days. Because of the advent of National elections, the Amateurs had decided to maintain radio silence from one week before to one week after this period. This was not requested by the government but was a voluntary decision.

As the evening wore on we talked further of the peculiarities and problems common to both countries, particularly with regard to distances. Two VKs were already well-known—Heable VK2AQK and Ron VK3AHJ. Beautifully bound copies of many issues of "Amateur Radio" and an Australian electronics magazine were produced, giving further evidence of unseen friends in VK-land.

Some six hours after my initial meeting with Kwik and his wife I was driven back to my hotel. During this whole period I had found great warmth and generosity in the friendliness and

hospitality offered to me, remembering that I had arrived unannounced and unexpected.

What then constitutes the Indonesian Radio Amateur? During the evening I had met people ranging from a Major-General in the Air Force, a retired businessman, an engineering manager, a housewife to an odd-job man—proving that in this country also Amateur Radio is not for the chosen moneyed few but for all who have an interest and the ability to learn and pass the examination.

The examination is not an easy one, in many respects harder than ours. It is divided into three graded levels:

(a) **Preliminary Level.**—A knowledge of local and international regulations, theory, practice and Morse at 5 w.p.m. will gain a limited licence (YD), enabling crystal controlled operation between 3.5 and 3.9 MHz. at 10 watts maximum input.

(b) **Intermediate Level.**—An increased knowledge of the above plus Morse at 8 w.p.m. and an ability to understand the English language will allow for a limited licence (YC) with crystal controlled operation in the h.f. (except 14 MHz.), v.h.f. and u.h.f. bands at a maximum of 75 watts input.

(c) **Advanced Level.**—Further knowledge of the above plus Morse at 12 w.p.m. will allow a full licence (YB) on all bands at a maximum input of 500 watts.

It is interesting to note that Morse code is a requirement in all levels and a good working knowledge of English in the higher two sections. Part of the practical test is the actual building of a transmitter by the applicant.

Although the Indonesian Government has considered and approved regulations and technical qualifications needed by an operator and his station (1967/68), it has for the moment delegated the authority of examination procedure to the Regional Groups of which there are nine. As can be expected, these Groups keep a very tight rein on those wishing to obtain a licence and the operation when actually on the air because they do not wish to lose any of the advantages given to them.

Even so, there are over 2,000 Amateurs in the whole of Indonesia (approximately 250 in Djakarta). Why then do we not hear more of them on the air? The answer is mainly a monetary one. Most rigs are on the 3.5 MHz. band and are a.m. types. Those owning commercial s.s.b. equipment in the country total fifteen (excluding expatriates) of which I had seen three in one evening.

Unlike many other countries, Indonesia is radio minded. A few years ago Kaklum (YB0BY) started teaching

four persons the fundamentals once a week of about two hours duration. Early this year he had to give up this undertaking because of a change in his work plus the fact that the group had grown to more than 130 per session. Five other Amateurs have taken over this important task.

While all that I have mentioned so far gives a very promising future for Amateur Radio in Indonesia, it must not be thought that there are no problems. In fact, the reverse is the case and the problems are great. While there are people like Kwik, Wondo, Kaklum and Erica, plus many more I have yet to meet, these problems will slowly be overcome. There is much that we, through the W.I.A. and personally, can do to help the movement in this rapidly developing nation.

It is obvious that my life in YB-land, which will last at least a year, will become a very interesting one radio-wise as my main work will take me to all regions and to Amateurs whose total income per year is less than the average Australian gets per week.

☆

JAPANESE TRANSISTORS

Through the courtesy of Peter Williams, VK3IZ, "A.R." now possesses specifications and ratings of a number of Japanese FETs, v.h.f. and p.a. transistors. He believes that many Amateurs possessing Japanese equipment may be interested in these ratings if replacements are required at any time. The lists run into several pages, mixed in with Japanese calligraphy and are by courtesy of the "CQ" (J.A.R.L.) Handbook.

If any reader is interested in any of this information, would he please write to the Editor giving type number so that in a future issue it may be possible to extract data of the more popular varieties for publication in "A.R."

☆

ERRATUM

Re the article "Angle Modulation", Lecture 14B, in "A.R." August 1971, page 3. The author has pointed out that a few lines have been omitted from the first paragraph under the heading Frequency Modulation in column 1. The paragraph should read:

When using an audio frequency voltage to produce f.m. it is the amplitude of the voltage which causes the carrier frequency to shift or deviate symmetrically from its assigned frequency. By international agreement the maximum deviation is ± 75 kHz. for sound broadcasting with an audio frequency pre-emphasis of 75 microseconds. However, in Australia for television sound the maximum deviation is ± 50 kHz. and audio frequency pre-emphasis of 50 microseconds.

REPEATER SECRETARIAT

We have been advised from VK2 that additional repeater systems are being developed at the moment and some have been lodged with the P.M.G. for approval.

Central Coast, Gosford. To serve the area north of the Hawkesbury River, south of Lake Macquarie and east of the coast from the Pacific Highway. The equipment is to be installed at the local clubroom site, which is about 4 miles south-west of Gosford on a ridge of high ground. To avoid interference in Sydney, due to expected strong signals from Wollongong, the antennas will have reduced gain in the southern direction. It will be a Channel 1 system.

Central West, Orange. This system has been operating for some years and is located on Mt. Canobolas. At the moment it is a Channel 1 input with a Channel A output.

Hawarra Branch (Wollongong) of the N.S.W. Division. This system is to be located about 60 miles south of Sydney. It will serve parts of Sydney, Wollongong, the south coast townships Batemans Bay, inland towards Canberra, which will cover much of the Hume Highway from Sydney to the border on the New South Wales-Yass. The repeater will be tested in the Wollongong area first and later it is hoped to install it on the high ground west of Kalmar near the local t.v. station. There is also a plan to establish a 6 mhz beacon in the Wollongong area.

Hunter Branch, Newcastle. Permission has been granted to establish a Channel 4 system for this area on Mt. Sugarloaf, it is to be installed at the local t.v. tower site.

Sydney. The Channel 4 system for this area is currently using an A.W.A. 4 in place of the previously advised S.T.C. unit. The original beacon facilities have not been included at this stage. Identification is by a voice tape loop, but will be replaced by an IC keyer.

Wagga Radio Club is to establish a Channel 1 system to serve the eastern Riverina. At the time these notes were compiled the final site was not known to us. The equipment is to be low powered and solid state.

Another problem area is Melbourne and possibly Sydney where several repeaters are (or will be) operating. The original 3-channel concept of Woods' (1968) for Channel B simplex and Channels 19 and 4 for repeaters. The reason behind this was to ensure that all "service" repeaters (like the present f.m. systems) were developed on the minimum number of channels so that the maximum number of people would have the required crystals and accordingly be able to use the system no matter what part of Australia one travelled to.

The problem has arisen in Melbourne where they have Channel 1. To the east in Gippsland and to the south-west at Geelong there are Channel 4 systems which will not be long before a system could be required in the south. The Channel 4 systems both have good coverage into Melbourne with the result that one is often able to trigger both units. The question now is: (a) should there be additional channels? (b) should the coverage of overlapping systems be reduced to limit interference? (c) or put up with the problem, if not too severe, so as to preserve the two-channel concept? What do you think?

The F.R.S. Report mentioned in recent "A.R." was delayed in publication, but should be in circulation at the time these notes come out. The Federal Repeater Secretariat is a committee of three members who act on behalf of F.E. in co-ordination of v.h.f./u.h.f. matters with repeaters, beacons, nets and satellites, etc. The postal address for the F.R.S. is C.O. P.O. Box 342, Crows Nest, N.S.W., 2065.

Looking forward to hearing Amateurs' views on the points covered in this report, but please bear with us if we are a little slow in the reply, we usually have trouble in rounding up a good one-fingered typist.

A service to members only

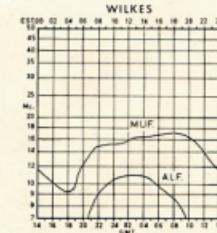
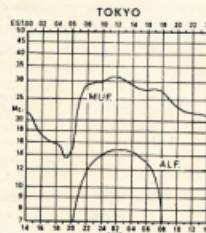
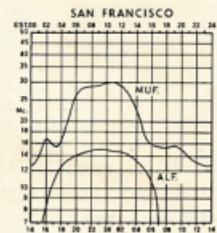
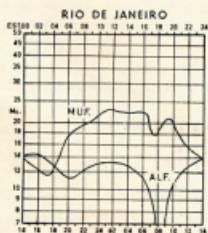
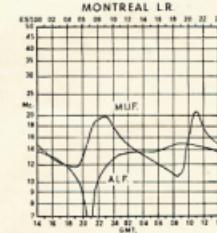
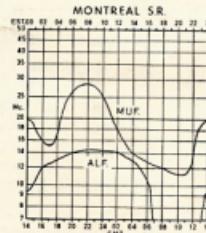
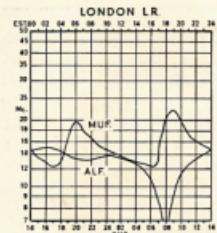
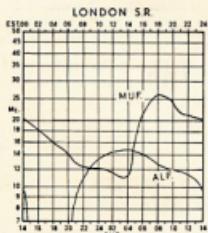
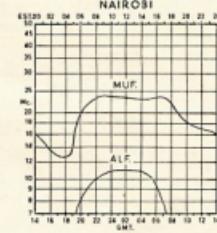
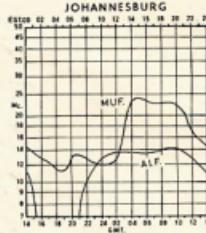
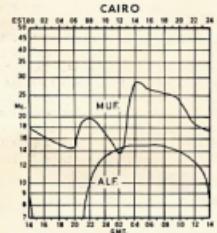
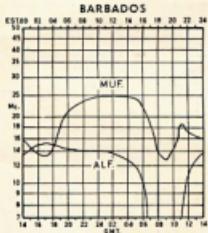
COMPONENTS FOR HOME-BREW GEAR

For lists of components actually available from stock, write to—

THE DISPOSALS COMMITTEE,
VICTORIAN DIVISION, W.I.A.,
P.O. BOX 65,
MT. WAVERLEY, VIC. 3149.

PREDICTION CHARTS FOR OCTOBER 1971

(Prediction Charts by courtesy of Ionospheric Prediction Service)



OBSERVATION POST

By H. F. Evertick

"There is more in heaven and earth, Horatio, than is dreamt of in your philosophy."

How many times have you read a reason d'etre for Amateur Radio? When frequencies come up for discussion there are always people who are ready to say Amateur Radio is finished, washed up, kaput.

They say the shiny black box has killed the art.

They believe that a number of Amateurs today cannot even service their shiny black boxes; and, even if they could, they would not dare do so for fear of depreciating the resale value.

Others come up with the argument that commerce is way ahead of us and what's more will become even further ahead as the result of research and exploitation of new techniques.

Stop a moment. Has it really been any different? Were all the pioneers of electricity and electronics Amateurs? Did not an Amateur invent and develop the semiconductor?

And what about all those old time sets? I can remember many old time pieces of commercial gear. I must admit though that the percentage of home-brewing was higher yester-year. But set against this, the number of Amateurs was very considerably less. How many Amateurs were licensed in 1938 compared with now—a tenth, maybe.

Yes, you will say, in these days we did all our own metal bashing. This was after the breadboard went out of favour and components began to be constructed with wire connections instead of screw-type connectors. The hand-up wire was a common sight. Come to think of the gimmicks, you will say, and we Amateurs merely followed suit. Along came disposals gear which we merely adapted to our own purposes. We followed the techniques of printed boards, and of course have thrown out the valves except possibly for r.f. power amplification because it is cheaper.

Now we need slim fingers, pencil point soldering irons and a magnifying glass for constructional work. Heavens above, I do believe we even buy printed circuit boards all made up ready to set in the appropriate components. Before long, we might hook up a row of ICs and hey presto, there is a receiver ready to go. No need to bother with modules ever again.

Yes, I do not doubt the facts. Rather than becoming pessimistic about all these trends, however, I feel a little optimism coming on. It is good that the commercials go ahead and become ever more specialised. What splendid things they are to us.

Make no mistake. We Amateurs are still the only mob who not only communicate around the globe, but, to a large extent, can hopefully keep our gear pushing out the watts and our receivers bringing in the intelligence under all kinds of most difficult conditions. The specialist must ever strive beyond his horizon but nevertheless must keep his feet on the ground. What better way for him to keep in touch with ordinary mortals than through Amateur Radio. It is a blend of a whole range of skills—specialised and ordinary. Amateur Radio is unique and limitless as someone said the other day.

It is not solely a question that the world needs people to do something for no cash reward. Without the Amateur Service and its influence, the world would be a much poorer place where it is today. There is constant feed back between the two. By definition the specialist concentrates on one field of activity. By his achievements in many diverse spheres of activity is the Amateur known.

LICENSED AMATEURS IN VK

JUNE 1971

	Full	Lim.	Total
VK0	11	1	12
VK1	85	30	115
VK2	1420	487	1907
VK3	1310	661	1971
VK4	523	204	727
VK5	519	227	746
VK6	367	138	505
VK7	156	65	221
VK8	37	12	49
VK9	88	11	99
4516	1826	6352	Grand Total

THE SOUTHERN CROSS AWARD

The Southern Cross Award was instigated on 1st July this year to promote more activity on all Amateur bands. The Award is predominantly Australian by its name, the colours being green and gold.

Conditions of Award: Australians and New Zealanders to work 15 members of the Eastern and Mountain District Radio Club. DX stations to work five members of the Club, or three members of the Club plus VK3ER—the official Club Station, which counts as two contacts.

This Award is open to all Amateurs and S.w.i.s. Band and mode endorsements are available.

Australian Amateurs must forward the sum of 50c with their application. Overseas applicants must enclose eight IRCs. This Award is free to the legally paralysed or the blind.

Applications are by an extract of the log only, countersigned by two other licensed Amateurs, being sent to the Awards Manager, Eastern and District Radio Club, P.O. Box 87, Mitcham, Vic., 3132.

As this Award follows the Certificate Hunters Club conditions it will count for C.H.C. credits.

VK3ER is active on all h.f. bands, 144 MHz. a.m. and f.m.

DISTANCE TABLE FOR ROSS HULL MEMORIAL V.H.F. CONTEST

Computer Great Circle distances with first order corrections for non-spherical earth shape. Accuracy ± 2 miles.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1	0	1172	828	2019	1001	596	1905	1638	1827	394	722	644	408	236	768	1328	1075	720	1198	2003	
2	1172	0	1235	3141	2133	2619	2339	1716	2817	1486	1665	1642	1515	1286	1940	239	2116	1891	2074	3071	1867
3	828	1235	0	2596	1219	1217	2589	809	2550	179	1534	1445	1175	1061	1260	1241	1057	1262	888	2647	1254
4	2019	3141	2596	0	1434	1434	472	3207	658	1659	1563	1509	1634	1860	1331	3226	1744	3048	302	1352	1198
5	1001	2133	1219	1434	0	59	1571	1773	1770	901	1126	1032	964	1018	395	2248	313	471	684	1569	508
6	596	179	1217	1434	59	0	1375	1959	1333	327	533	437	290	496	223	1924	830	15	1122	1447	116
7	1805	2358	258	472	1571	1375	0	3292	192	1515	1724	1307	1500	1707	1347	3147	1886	2254	190	1265	1198
8	1638	1754	100	3297	1773	1959	3292	0	3290	197	2336	2239	1955	1668	1946	1654	1509	1968	1168	331	1881
9	1827	2817	2550	651	1770	1333	192	3280	0	1438	1161	1205	1242	1617	1337	3031	1916	1312	2285	383	1300
10	394	1485	1779	1659	901	327	1513	1973	1434	0	368	266	39	200	549	1669	108	478	1319	1621	443
11	722	1655	153	1569	1126	355	1274	2332	1161	360	0	103	374	490	732	1873	1384	658	1639	1469	817
12	644	1842	1445	1569	1032	437	1307	2239	1205	266	103	0	275	418	641	1843	1264	564	1536	1431	526
13	408	1515	1634	864	864	290	1500	1965	1422	38	374	275	0	229	512	1695	1051	440	1287	1692	405
14	236	1286	1061	1862	1018	496	1707	1868	1617	200	490	418	229	0	707	1469	1158	642	1339	1817	611
15	768	1940	1290	1331	395	223	1347	1946	1337	549	732	641	512	707	0	2050	665	77	998	1506	116
16	1328	239	1241	3248	2248	1904	3147	1854	3031	1689	1773	1843	1895	1499	2090	0	2198	2047	2114	3273	2025
17	1075	2116	1057	1719	313	830	1880	1506	1916	1085	1364	1264	1051	1156	663	2198	0	731	375	1871	675
18	720	1861	1262	1344	471	150	1332	1968	1312	476	656	544	640	727	2047	731	0	1052	1385	39	
19	1198	2074	888	2068	684	1122	2254	1156	1285	1319	1638	1287	1309	1946	996	2114	375	1052	0	2245	1081
20	2003	3071	2647	302	1599	1447	190	321	363	1621	1409	1431	1920	1817	1508	3273	1871	1386	2245	0	1385
21	698	1867	1264	1352	508	116	1326	1961	1301	443	617	528	405	611	116	2026	765	39	1081	1385	0

LET US HELP YOU GET ON THE AIR-NOW!

Complete VHF Station consisting of INOUe ICOM IC20, MAICO PSVR1 AC Power Supply to suit, STOLLE ROTATOR, 44 ft. tilt-over Telescopic Tower, 10 Element 2 Metre Beam, EVEREST 2 Metre 5/8 Mobile Whip—all for \$6.00 per week.

COMM. RECEIVERS: Realistic DX150A, \$234.20, \$3.00 per week.
Trio 9R59DS \$178.50, \$3.00 per week.

These credit facilities are available throughout the Commonwealth

Stolle Rotators \$55. 2 mx 10 el. Yagi \$20. Maico PSVR1 240v. AC, 13.5v. 2.5a. DC Power Supply for solid state 2 mx TRSV, \$41.50. Maico PS2 240v. AC, 13.5v. 8a. Power Supply for Carphone as Base Station operation, \$33. Everest 2 mx 5/8 Mobile Whip (state base thread) \$16, with base \$20. 2 mx 1/4 wave Roof Whips, RMW/2S, complete, \$7.50. Knock-Down Adaptor, \$7.14. Spring-Back Adaptor, \$5.52. Roof Mount Base, \$3.55. 432 MHz. Roof Whip 5/8 wave, RMW-311/L, \$13.66. Rechargeable Alkaline Cells, size D, \$2. each.

Industrial and Medical Electronic Co.
6th Floor, 288 LITTLE COLLINS STREET, MELBOURNE, VIC., 3000
Phone 63-9258, A.H. 848-3018. Distributors for TEXTRON Group of Companies. See adv., p. 2

ROSS HULL MEMORIAL VHF/UHF CONTEST, 1971-72

The Federal Contest Committee of the Wireless Institute of Australia invites all Australian and Overseas Amateurs and Short Wave Listeners to participate in this annual Contest which is held to perpetuate the memory of Ross Hull whose interest in v.h.f./u.h.f. did much to advance the art.

A Perpetual Trophy is awarded annually for competition between members of the W.I.A. in Australia and its Territories, inscribed with the name and life work of the man whom it honours. The name of the winning member of the W.I.A. each year is also inscribed on the Trophy. In addition, this member will receive a suitably inscribed certificate.

We welcome proposals (in writing) to improve this Contest.

OBJECTS

Australian Amateurs will endeavour to contact as many other Amateurs in VK Call Areas and Foreign Call Areas under the following conditions.

DATE OF CONTEST

From 0001 hours E.A.S.T., 11th December, 1971, to 2359 hours E.A.S.T., 23rd January, 1972.

DURATION

Any seven calendar days within the dates mentioned above, not necessarily consecutive. These periods are to be at the operator's convenience. A calendar day is from 0001 hours E.A.S.T. to 2359 hours E.A.S.T.

RULES

1. There are two divisions, one of 48 hours duration, and one for seven days. In the seven-day division, there are four sections:-

- (a) Transmitting, Open.
- (b) Transmitting, Phone.
- (c) Transmitting, C.W.
- (d) Receiving, Open.

2. All Australian and Overseas Amateurs may enter for the Contest whether their stations are fixed, portable or mobile.

3. All Amateur v.h.f./u.h.f. bands may be used, but no cross-band operating is permitted. Operators are cautioned against operating transmitting equipment on more than one frequency at a time, particularly when passing cyphers. Cross-band operation to assist contest working is prohibited.

Such operation will be grounds for disqualification. Cross mode contacts will be permitted.

4. Amateurs may enter for any of the transmitting sections. The seven-day winner is not eligible for the 48-hour award.

5. Only one contact per band per station is allowed each calendar day.

6. Only one licensed Amateur is permitted to operate any one station under the owner's call sign. Should two or more operate any particular station, each will be considered a contestant and must submit a separate log under his own call sign.

7. Entrants must operate within the terms of their licences.

8. **Cyphers:** Before points may be claimed for a contact, serial numbers must be exchanged. The serial numbers of five or six figures will be made up of the RS (telephony) or RST (c.w.) report plus three figures, commencing in the range 001 to 999, for the first contact, and will then increase in value by one for each successive contact. When a contestant reaches 999 he will then commence again with 001.

9. **Entries must** be set out as shown in the example, using only one side of the paper. Entries must be post-marked not later than **7th February, 1972**, and clearly marked "Ross Hull Contest" and addressed to **Federal Contest Manager, Box 638, G.P.O., Brisbane, Qld, 4001**.

10. **Scoring** for all sections will be based on the attached table. Approx. distances to be shown in the log entry as shown in the example. Failure to make this entry will invalidate the particular claim. **Operation via active repeaters or translators is not allowed for scoring purposes.**

11. **Logs:** All logs shall be set out as in the example and in addition will carry a summary sheet showing the following information:

Name Call Sign
Address Division
..... Claimed Score

SCORING TABLE

Distance in Miles	52 Mc.	144 Mc.	420 Mc.	576 Mc.	Higher
Up to 25 Miles	1	1	2	5	10
26 to 50	1	1	5	10	25
51 to 100	"	5	15	30	50
101 to 200	"	10	25	50	100
201 to 300	25	15	50	100	250
301 to 500	"	20	25	100	250
501 to 1000	"	10	35	200	300
1001 to 1500	"	15	100	250	350
1501 to 2500	"	25	125	300	450
2501 to 3500	"	35	200	400	600
3501 to 5000	"	50	300	450	550
5001 and over	"	100	400	500	600

EXAMPLE OF TRANSMITTING LOG (Brisbane Station)

Date/Time E.A.S.T.	Band Mc.	Emission Power	Call Sign	RST/No. Sent	RST/No. Rcv'd.	Dist. Miles	Points Claimed
24th Dec. 0100 E.A.S.T.	52	A3(a)	VK7ZAI	58001	58004	1110	15
0110 E.A.S.T.	52	A3(a)	VK4NG	58002	57051	330	20
0230 E.A.S.T.	144	A3	VK5ZK	58003	55043	990	35
0235 E.A.S.T.	144	A3	VK3ZJO	45004	46021	850	35

EXAMPLE OF RECEIVING LOG (Perth S.w.l.)

Date/Time E.A.S.T.	Band Mc.	Call Heard	RST/No. Sent	Station Called	Dist. Miles	Points Claimed
2nd Jan. 1000 E.A.S.T.	52	VKSZDX	59221	VKBKK	1330	15
1025 E.A.S.T.	52	VK2ZCF	58195	VKGZAA	2040	25
1110 E.A.S.T.	432	VK6ZDS/6	57061	VKEKL/6	60	15
3rd Jan. 0500 E.A.S.T.	144	VKSZJH	44102	VK6ZCN	1330	100

Operating Dates (7 cal. days)
Highest Score over a 48-hour period
was points.

Operating period:
from hrs. E.A.S.T. / /
to hrs. E.A.S.T. / /

Declaration: I hereby certify that I have operated in accordance with the conditions of my licence and abided by the Rules of the Contest.

Signed
Date

12. Entrants not abiding by the Rules of this Contest will be disqualified.

13. The ruling of the Federal Contest Committee of the W.I.A. will be final. No dispute will be entered into.

14. **Awards:** Certificates will be awarded to the winners of each section in each VK and Overseas Call Area. The VK contestant who returns the highest score in the transmitting section and who is a financial member of the W.I.A., will have his name inscribed on the Trophy which will be held by his Division for the prescribed period. A Certificate will be awarded to the contestant who shall not be the Trophy winner, and who returns the highest scoring log covering a period of any 48 consecutive hours.

Also, Certificates will be awarded for operating in the Ross Hull Contest and breaking any Australian v.h.f./u.h.f. distance record.

RECEIVING SECTION

1. Short Wave Listeners in Australia and Overseas may enter for the Contest, but no transmitting station may enter this Section.

2. Contest times and logging of stations on each band are as for the transmitting sections, however there is no 48 hour sub-section.

3. To count for points, logs will take the same form as for transmitting sections, but will omit the serial number received. Logs must show the call sign of the station heard (not the station worked), the serial number sent by it, and the call sign of the station being worked.

Scoring will be on the same basis as for transmitting stations, i.e. on the distance between the Listener's station and the station heard. See the examples given. It is not sufficient to log a station calling CQ.

4. A station heard may be logged only once per calendar day on each band for scoring purposes.

5. **Awards:** A Certificate will be awarded to the highest scorer in Australia or Territories.

CORRESPONDENCE:

NOVICE LICENSING

Editor "A.R." Dear Sir,

I would like to make some comments regarding the proposed W.I.A. approach on Novice Licences. Many excellent comments against the Novice licence were given in a letter in the July "Amateur Radio" and I can sympathise with them, except that it is doubtful if the Novice would cause an increase in t.v.i. The main cause of the increased t.v.i. from Amateur stations, in most cases, is the use of high power equipment for s.s.b. The plain fact is that high power, and suburban living, just do not go together. It seems to be a sign of prowess these days to exceed the legal limit, and t.v.i. is the result. Low power c.w. operation may afford a cause t.v.i., but the local t.v.s. sets do have broken ribbon, poor contacts in their tuners, and so on. Amateurs must accept that many t.v. and hi-fi sets are less than perfect and if one only wants to continue the operation of the station without violent arguments with the neighbours is to reduce power, then low power it has got to be. However, I digress.

The first comment regarding Novices is that I do not see why a limited licence should have to be obtained before passing a slow c.w. test. He is not a Novice; he proved that by passing a higher standard licence examination. I would like to see Limited licensees allowed to use the air on a limited basis, and that is all it could do, and it would certainly allow them much needed practice for the full exam. It would also allow them to work v.h.f. DX, which is often available if only the apparently weak carriers were keyed, instead of being modulated.

I also do not see any great need for Novice licensing if a change was made in the form of the exam. Multiple choice questions, such as used in I.E.T.s in their present examination, would enable persons to pass the exam, who are presently hampered by their inability to express themselves on paper. Furthermore, a multiple choice answer system would be an easier way to mark questions, and thus get a fair better idea of the standard of knowledge of candidates than the setting of a few essay questions.

The other points against Novice licensing, such as P.M.G. control, possible piracy after the expiry of the licence, etc., are all valid, and make a convincing argument against Novices. Our present exam, is not really very hard, when compared with others. Consider wealth countries, and in any case, what does Amateur Radio want? Quantity or quality in its members?

Finally, I must protest most strongly at the proposed frequency allocation for Novices. They are, as you all know, now concentrated on the "c.w. bands" or at least, those portions of the bands traditionally c.w. by Gentlemen's Agreement. Thus the poor c.w. operator, already limited in his operating to approximately 100 kHz, will now have to share the air in the h.f. spectrum, will now have to battle Novices as well as the odd phone operator who slips down for a quiet spot to work in. What is worse, the proposed new general licences on 3.5 and 7 MHz, include spots in the normal DX sections of the c.w. bands, that is, near the low ends. By the time we take over commercial in the 7 MHz band, the c.w. DX operator would find it increasingly difficult to keep up with the extra power to go on 3.5 MHz. On 3.5 and 7 MHz, 3535-3550 and 7025-7050 would be more acceptable; assuming we have Novices, which, of course, we hope we do not.

Finally, it may perhaps be pertinent to point out that it appears that W.I.A. members are very much divided on Novice licensing, and that much of the pressure for it comes from small groups. When taken as a percentage of the total licensed Amateurs of Australia, these are very much a minority. The unlicensed is somewhere between 50 and 60% of all licensees.

If Novice licensing is proposed to the P.M.G., I for one, will raise my voice against it, by writing to the P.M.G. and putting the case for and against. Novice has a right to be heard. However, I think that there will be no need for this, with a few revisions in the present system of exams, and licensing privileges, all parties could be satisfied without Novice licensing.

John H. Smith, VK3IQ.

P.S.—It may also not be out of place to point out that in the U.S.A., on 3.5 and 7 MHz, there is much more room for Novices, seeing that the bands there are 3500-4000 KHz and 7000-7300 KHz.

Editor "A.R." Dear Sir,

As the subject of Novice licensing is with us and is still open to plenty of discussion (and opinion), I felt urged, and to a degree motivated by VK3IRN, to well set our letter, to give my opinion on the subject.

The fact is that high power, and suburban living, just do not go together. It seems to be a sign of prowess these days to exceed the legal limit, and t.v.i. is the result. Low power c.w. operation may afford a cause t.v.i., but the local t.v.s. sets do have broken ribbon, poor contacts in their tuners, and so on. Amateurs must accept that many t.v. and hi-fi sets are less than perfect and if one only wants to continue the operation of the station without violent arguments with the neighbours is to reduce power, then low power it has got to be. However, I digress.

I want to base my argument on fairly practical aspects. Currently a person may obtain a Limited Full Licence at the age of 16, and is then quite old enough to be in the position of operating equipment capable of spanning the globe and communicating without supervision, in a proper manner. Whatever, Limited or Full licence, a 16-year-old boy has at this important stage of his schooling, and his future venture without some "parental controls" would get involved to the detriment of his studies if left on his own.

On the other side, there are boundless possibilities. Dad may have a station that son can operate. The boy might be able to talk Dad and/or Mum into a secondhand rig (or new), mono or triband for Birthday or Christmas, and so on. There is the possibility of radiating and receiving. Some frequency standards, whether crystal calibrator or frequency meter. All in all, you must admit, a reasonable outfit is involved to get out a 15-year-old boy into the "air". Be that as it may, Dad is on to communicate with all and sundry, with all the enthusiasm of a beaver building a new lodge. The argument that Amateur Radio interferes with school is old, but is as valid now as it ever was, and I'll wager there are many who will agree with me.

I command to you that the situation is just the same for a promoted Novice. But the problem arises at each stage. The 14-year-old has had a year to "get up" a suitable transmitter—simple yes, but time is required to do the job properly if he is to learn about the problems of layout, tuning up, soldering correctly, getting his antenna up, etc. (b) receiver okay, we can, if lucky, get away with the old 3-band ex-loungeroom receiver—all Novices get hold of one working well enough—some modifications will be required, more time (e.g. a long wire will suffice) or a little better, a dipole, the question is which band, what about somewhere to anchor it—will Mum and Dad be happy with it here or there?

Somewhere the Novice is on the air, then let's just assume he has a year (i.e. he managed to scratch together the required gear before hand) to operate in his spare time. Most young boys are too busy these days to be able to be engaged in some sport at week-ends, football in winter—cricket and swimming in summer. Then there are school projects, homework which must be done. Unless our Novice is possessed of a superhuman ability to do the operation required to get the speed up is not going to be there. I think I need continue no further along these lines. I am referring here to all promoted Novices generally. I'm quite sure someone could easily come up with a young lad flying through school and just as good at Amateur Radio. Anyone can come up with an individual situation to suit an argument.

Other points I would like to raise are (1) How will our young operator get experience talking properly by the use of telephony if he is confined to c.w.? The ability to "talk" to the other operator is a very important good c.w. Hams. Have a listen around and you'll see.

Finally, who will inspect his equipment to see that it is safe to use and not able to be "doctored" once on the air for Novice operation?

This letter has turned out much longer than I anticipated, but if we think about it, I do not think that the number of Novices we would get out of this, to become Full licensees will anywhere near be able to meet the scheme's needs, even an enthusiastic boy needs to be fed "a little bit at a time" to maintain his enthusiasm. I have a suggestion that could be worth kicking around, and for those who have come thus far, here goes.

Let us base our Novice on the 14-year-old. The Novice licence be as suggested and for one year. However, instead of having a lot of Novices with their own bits of gear, etc., I suggest all Novices become members of Y.R.C. where they continue along as before, but with allowance to operate the Y.R.C. station on their own. Restrict them to 25 KHz for c.w., but give them telephony practice too.

As far as the other members of Y.R.C. not Novice, the advantage of seeing some of these members actually operating the station will be the incentive they need. Many problems are eliminated—(1) Parent-child relations improved (no serials or equipment about the home); (2) Novices get their operating experience in times already existing—have a roster if you must but something could be worked out; (3) P.M.G. would be much happier in the knowledge that the Novices will be all operated from one central group under supervision; and (4) under this method those lagging a bit could be spotted and pushed along.

I believe this way, that the returns from Novice would be much higher, and having been a member of Y.R.C. would be more likely to become members of W.I.A. I honestly believe we would achieve a lot more success, but I guess some Y.R.C.'s could be overloaded, then again, the P.M.G. could say, "C'mon, it could become two separate nights and on."

Personally, I think too many of us have forgotten the elation we felt when we passed the exams for Full ticket and, I think, a lot more people do now. I would like to see us get our Novice standard up to Full Licence standard and wouldn't we be better off? There would be no need for Novice licensing in the first place. Obviously, along the way, in writing this, I have missed a point or two, or failed to elaborate completely a point made, but the basic idea is there, and I hope clear enough to understand.

—Peter P. Morrow, VK2BMP.

Editor "A.R." Dear Sir,

I have found that the letter I wrote to "Amateur Radio" on 26 July has been photostatic copied and sent on to Mr. Rex Black, VK3YKA, Grafton, N.S.W. for his information. On the 11th August I received a long three-page letter from Rex in reply to my comments. I am not retired, like Rex, and have limited time available for letter writing, therefore I have omitted parts of commenting a private correspondence series with him, and his letter is included, along with my reply.

This letter refers to Rex Black's letter and others, "A.R.", so would you be good enough to publish a copy of the letter from Rex to me, also?

In para 2, Mr. Black questions my comments about countries which do not have Novice licensing. I want to refer him to Mr. Higham's letter in July "A.R." which states that out of the Committee refers that: "these countries are technologically retarded as they have no Novice licence"—unquote. This is correct and Mr. Higham has written this in his writing that "It is easier to obtain a licence in England and New Zealand because the standard is lower than Australia (30% for a pass) so they can get adequate numbers of Amateurs with their lower standard". Surely not concerned with the poor 32% of licensees (in VK3) who are members of the Institute?

The latest count shows nearly 4,000 in VK2 and VK3 combined, a figure of slightly over 6,000 for Australia; this is a good number and our object is to obtain a higher percentage of these licensees as FULL members of the W.I.A. I have stated in my last letter, we urgently need to make the W.I.A. more attractive, such as the State Convention held at H.M.A.S. "Cerberus", Crib Point, Saturday, 24th July. Thanks to Dr. S. J. Lloyd, VK3CDR, the Vic Div. President and his assistants no employee of the R.A.A.F. has been held at the kind of attraction can bring the members together under convivial circumstances and make the members feel that they belong, and by having a series of picnics, maybe have the members something to look forward to.

There is no need to create a new batch of "low standard Amateurs," to quote Mr. Black. Paragraph 3. We do not have a steady stream of renewals, and we have to again say this is a negative attitude. Let us look at some fees and compare, since there is a general increase in all places:—

Combined T.V. & Radio Licence	\$2.50
Associate Licence	\$—
I.R.C. (low grade)	\$—
Bowling and Tennis Club	\$2.00
W.I.A.	\$1.00

Paragraph 4. Mr. Black seems to imagine that all the new multitude of Associate members would automatically happen. We would have to wait until the W.I.A. and Novice licensing arrangement was launched. How does he propose to make sure that 100% of the Novice licensees are going to join the W.I.A.? Perhaps his scheme could be applied instantly to the Novice licensees to join the W.I.A. as FULL members.

Paragraph 5. Condemning Novices because the P.M.G. may increase the fee is not the point, the extra burden is objectionable and makes the Amateur Service an extra nuisance

as far as the Radio Inspectors' Department is concerned. The Committee's idea for an examining committee is an excellent idea, but what is your point? The examination is no problem—you can issue a Novice licence at say 50% pass, but the administration of all these extra licences is the administration.

Paragraph 6. Mr. Black has set down a complex series of examination details in parts A and B to ensure that the Novice has to be near perfect in his answers to part A. This paints a beautiful picture of a Novice who will be quite a minor wiz. Morse key built in, but I am sorry to dispel this vision. Why is he any different from a regular A.O.C.P. student? Mr. Black is going to test the Novice with a 100 word/min. speed, a 100 word/min. key clicker, and spurious radiation, so any suggestion that a Novice would be incapable of satisfactory operating after such a test would be negative—unQUOTE. I presume Mr. Black will probably be right, but I am afraid that Novices will ever cause any of the above QRM. The latter part of the paragraph sounds sad and I am sorry that you have had such a high percentage of dropouts at the Goshford Radio Club. Don't give up in despair, Melville! I found that anyone who is really keen will gain an A.O.C.P. no matter what his profession or work happens to be.

George Thompson VK3TH, and I started the W.A.R.L. classes on a business basis, in November 1932. George was manager, Bob Dalton, VK3UJ, Morse Instructor, and I was theory and regulations instructor. We conducted a maximum of 40 persons and at the end of the first year the average was down to 23, but they were keen and we usually obtained 80% passes. Each pupil was automatically made a student member of the W.I.A. and received all privileges and the magazine "A.R.L." for a year.

The members who operated on the broadcast band in those days were granted permission by the Radio Inspectors' Department, to advertise their A.O.C.P. classes and we were all fully booked up. I have forgotten the fees charged, but I think it was about five guineas including a copy of the A.R.R.L. Handbook and "somebody's" electricity and magnetism.

I had to resign in December 1932 to take a country broadcast station appointment. The present A.O.C.P. classes are a continuation from these days, 34 years later, and still very satisfactory.

Paragraph 7. The school boy I can quote is my elder son VK3ZP, whom I said I "taught him to send". He is now a trained, like myself, as a school master, but all the information I have quoted is accurate and you might do some research into the days of the W.I.A. when the VK2 classes were called "The Association of Radio Amateurs (N.S.W.)"—later to become the VK2 Division.

Further on your reference to how hard it is to pass the A.O.C.P.—I know from vast experience that if you are keen enough you can do it—you sit on the train and read all the advertisements as they pass, in Morse—and you write the formulae on cards and carry in your pocket so that you can glance at them at any time and not worry.

You say that you cannot recall a Goshford Club trained member ever having a c.w. QSO. Well, it is not the prerogative of the A.O.C.P. holder to use any mode of communication which he has not learned. You say: "Yes you say that: 'Had they had a Novice licence first they would have gained and retained Morse skills which they certainly do not have now.' This is not true. If a student can pass 5 w.p.m. he is qualified to operate 10 w.p.m., he can raise his speed to 20 w.p.m., it is much more difficult to raise speed to 20 w.p.m. and many c.w. men operate at this speed, so what is the point?" The speed is controlled by the slowest operator in a group, and your argument is the same be it Morse skill or theory and regulations skill, the person who has just passed the A.O.C.P. and is not engaged in the business of telegraphist or electronics engineer is at a considerable disadvantage to the man in the field until he gains some considerable amount of experience.

I did not say that school physics covers the theory of wave propagation, but I do say that the student is prepared for the A.O.C.P. examination by school work?—he is conditioned by the school training and examinations are easier than to a mature person who has left school 20 or 30 years ago. The student only needs to study the A.R.R.L. Handbook or attend the W.I.A. classes. You are splitting hairs about the regulations.

Paragraph 8. Mr. Black says that 160 metres is not a required wavelength. I agree with that Novices could use 1800 to 1900 KHz. This is rubbish—the whole band?—why don't you poor misguided people have a listen on this band, to the W.L.KL. etc., etc., signals coming through? I will concede that there are times when the DX does not come through and you could put Novices on for local practice, but

how could you police it? Or supposing the band is open for the 150 watt stations. You have so many restrictions on the Novice licence that you sound like a "Police State". None of my friends would be interested in such regimentation of frequencies and hours of operation. Offering a restricted band width to the Radio Inspectors' Department to many stations to avoid t.v.i. and b.c.l.—what a negative attitude to adopt, why not fix the interference?

Paragraph 9. It is good to hear that the Novice Committee is prepared to bring to the notice of the Federal Executive, the subject of special treatment for handicapped persons. It has been my experience as a member of the W.I.A. for over 10 years that the Superintendent Radio Branch has always made every effort to make it possible for a handicapped person who is very keen to gain the A.O.C.P. to do so with special consideration in accordance with the regulations, and no genuine case has ever been refused.

You must realise that no set format could ever be drawn up to cover all situations. I agree the Institute should appoint a committee to do research on this subject. You say that: "Stepping up the W.I.A. assistance for a handicapped person would make the government authorities who are responsible for caring for these people regard this programme with favour and the W.I.A. would be able in its efforts to retain our allocated frequencies, which are threatened by lack of usage and envious eyes of commercial interests"—unQUOTE.

Why do you and many other members of the W.I.A. feel that the old fashioned way of saying "lack of usage" and "use our bands to greater advantage"? There is too much talk and no action! If everyone who says or even thinks that the bands are not being used, would make it possible to immediately clear the air, this mythical problem would disappear!

Take the common popular five bands from 3.5 to 39 MHz, which most transmitters and receivers will cover, and I promise you a QSO can be made any minute of the day or night, on one of them.

I do not have as much time to be on the air as I would like, but my log shows 40,263 contacts in 1970, which was not on the air from September 1970 to December 1970 (and I hope you were not), that is an average of nearly three QSOs per day and anyone can do this and I know people who make more.

Paragraph 10. Mr. Morgan's letter in "A.R.L." for February 1971 is as very well as to make reference to people not taking the trouble to submit their opinions to the Committee immediately. Didn't you know that the people who are still engaged in running active businesses would not be able to have time to reply to your letter in "A.R.L." before the 5th of the month, when "A.R.L." arrives on about the 3rd?

Ron Higginbotham's long study on the subject of NO NOVICE LICENCE was printed in July "A.R.L.". I have read it twice and in consideration of the trouble he went to to cover all the "timid" points that the Committee put forward.

I take the subject of Novice licensing very seriously because of the repercussions which I believe have taken place, and Mr. Black is only convincing me about his claim. 10.4% anti-Novice, when he publishes in "A.R.L." the statements submitted to the Committee prior to the compilation of the Novice report. I say that the Novice report is not biased in favour of Novices, but I detect a note of sarcasm in your statement: "Most of the anti-Novice arguments submitted were pitifully weak and were not backed up by any logical reasoning."

I take it that Ron Higginbotham's and my letters fall into this category?

Paragraph 11. Congratulations Rex on getting an FT2400 transceiver and I hope to speak with you again.

Paragraph 12. It is the logical thing to continue the activity of the Novice Committee and let them submit a later report because until the 1971 Federal Convention, little or no publicity had been given to the subject and no discussion amongst W.I.A. members, in this State, took place.

The Novice Committee produced its report on April, 1971, one week before the 1971 Federal Convention, but Mr. Black left "A.R.L." was in the February 1971 issue. So is it not rather obvious that there was not sufficient time to receive considered opinions in the corresponding columns of "A.R.L." before the report was made?

Mr. Higginbotham's report was published in July 1971 "A.R.L." So I suggest that the gentlemen in the Committee were busy making up their report with the other officers and arguments from the members of the W.I.A. and other States.

Paragraph 12 (continued). Mr. Black, you must remember now that you are retired and no longer a school master, therefore refrain from speaking to me as though I am one of your young Novices! You have "directed" me to send my "for and against" arguments to my

Divisional Councillor, Dr. Deane Blackman, instead, I am sending this to the Editor "A.R.L."

I agree Dr. Deane Blackman, who is engaged by our Company (Herald-Sun T.V. Pty. Ltd., Ch. 7) for all the Apollo Missions, performs an excellent service and is enjoyed very much by the public.

Many thanks for your long letter, you went to a lot of trouble, but this subject is not one to be taken up by individuals corresponding with each other, it has to be on the open forum of our "A.R.L." magazine.

Finally, I wish to make some comments on Mr. Michael J. Owen's "Federal Comment" in July "A.R.L." on "R.E.L." and the proposal of "Novice Licensing Again"—Report of Basis:

Item 1. In these days when matriculation is definitely a more difficult examination than it was at the beginning of its introduction, Qualifications for entry to the I.R.E.L. are higher. Standards of examination are more exacting. So are any much more complex than in my day. Why, for Heaven's sake, talk about lowering the standard of the theory examination in order to issue a third rate A.O.C.P., called a Novice?

2. No comment.

3. If you are keen enough you can practice to 10 w.p.m. instead of 5; this is unnecessary.

4. Too restricted.

5. Not necessary.

6. This needs to be qualified. Would the certificate be cancelled at the end of one year? I don't believe this would be practical. It would be unacceptable to most people, I have found that most A.O.C.P. holders remain as such and the few who go from A.O.C.P. to A.O.C.P. would have gained the A.O.C.P. if we were not blessed with the A.O.C.P..

7. No comment.

8. Naturally.

10. Too restricted. How do you police it?

—Ivor Morgan, VK3DH.

[Following is Mr. Rex Black's letter in reply to Mr. Ivor Morgan's first letter in "A.R.L.". Mr. Black's paragraphs have been numbered so that readers can refer to Mr. Morgan's comments.—Editor.]

Mr. Ivor Morgan, VK3DH,

Dear O.M.

The Secretary-Manager of the W.I.A. has sent me a batch of photostat copies of letters to "A.R.L." on the subject of Novice licensing. I must thank you, therefore, for taking sufficient interest to put your ideas on paper and for contributing to the debate on this interesting topic.

2. I do not think that anyone would agree with the proposition that France, Germany, etc., could be classed as technically backward because they have not yet adopted licensing in their Amateur Services. However, keep in mind that it is easier to get an Amateur "Ticket" in Britain than it is here in Australia. The examination is conducted by the G.P.O. but by the Civil Service Gulls (Australia) and the exam. pass mark is only 50% compared with our 70% pass. Under such circumstances it is doubtful whether Britain and New Zealand (not 50% pass) need Novice licensing, as there can be considerable numbers of Amateurs with their lower standard.

3. The matter of getting a greater percentage of VK Amateurs into the W.I.A. is—1 agree—of immense importance, but I cannot see much hope. With the increase in feed there is a steady increase of amateur stations. After all, the W.I.A. is not like a trade union which one must join. It is purely voluntary membership and is hard to exert pressure on Amateurs who do not see any benefit in becoming members. Problem is how to convince them. I think the figure at present is about 53% of licensees as Institute members—as you state, a "dreadful deficiency"—and I just don't know the answers.

There is an economic problem, with current inflation rates and some people with families find that there are priorities in their spending and Institute membership is a luxury that some cannot afford.

4. Ron Higginbotham quotes the fact that Associate members are not worth much to the W.I.A. as are Full members, as Associates pay lower fees. Therefore, if we get Novices, they should be Full members. The Committee gave a lot of thought to this point. I can assure you and we felt the more associate members would resent having only equal status with the Novice group. On the other hand, in U.S.A. the A.R.R.L. accepts Novices as Full members. In my opinion, the arguments we made would have found someone to criticise from one side or the other, so we decided that the probable wishes of the older and established members should be considered—hence the idea of Associates.

5. I doubt whether there is any real reason for condemning the whole idea of Novices just

because the Radio Branch might (unproven) find itself compelled to increase licensing fees. After all, the scale of fees is set down in a table and Amateur Service stations are only one of a long list. If the Administration is going to state that Novices will create an unnecessary load on the Radio Branch, the W.I.A. could readily offer to assist in the examination and Morse testing. As I stated before, the British licence written (theory and reg's) is set and marked by the City and Guilds Institute and not what the Radio Amateurs examination is administered by a Committee on which the R.S.G.B., the G.F.O., the City and Guilds, and the Ministry for Science and Education are represented. Thus, there is precedent in a British authority for the examination body to be different from the licensing authority. A similar type of offer might be made here to form an examining committee comprising reps. of P.M.G., W.I.A., I.R.E.E. and Tech. Education Dept. It would be at all times responsible when it can be made to see that a reasonable offer will not fall on the Radio Branch, nor on the W.I.A.

6. Re t.v.i. and b.c.l., I think this fear is more apparent than real. You ask "who could be less experienced than a Novice?" The answer is "I". Full A.O.C.P. licensees who I have struggled through a blackboard and chalk type of course and just managed to gain a minimal 70% pass without any real Radio background. There are plenty of these and I could point a finger at many others. I am sure that they would be coloured by the lack of detailed information on the Novice proposals. The Novice is not merely a chap who has enough money to buy a black box and get on the air. According to the Radio Amateurs' Committee, Novices would be just as well trained and examined in theory covering up to the w.e. equipment as the Full A.O.C.P. candidate. If we regard the A.O.C.P. theory course as comprising (say) 30 topics from t.v.i. and b.c.l. through to s.s.b. and c.w. marks, then the Novice would have covered all the basics and c.w. transmitters and t.v.i. and b.c.l. and key click filters and serial design up to the stage where he could handle that part of a transceiver station. We mustn't forget the possible "newcomer" Amateur exam. would involve two parts. Part A would be the section where all Novice licence candidates would be required to answer all questions and the questions would be of a general nature. Part B would be completed (as well as Part A) by candidates for A.O.L.C.P. and A.O.C.P. and would include questions on modulation, etc., right up to s.s.b. In other words, the Novice would be tested on A.O.C.P. knowledge on a limited range of topics with special stress, we feel, on t.v.i. and b.c.l. and clicks and spurious radiations appropriate to his mode of transmission which would be c.w. only. So any student of the Novice course would be fully satisfied of satisfactory operating after such a test would be negative. We hope that the Radio Club would take a major part in the training of Novices and in supervising and helping them to get on the air after completing their theory tests, their transmitters and ancillary equipment under club instructors' supervision. I have had a fair bit of experience in the matter of Radio Club instructing of A.O.C.P. candidates and can assure that the Novice licence would give immediate incentive which, under present conditions of instruction and examination are too high. There are plenty of mature and responsible men who start A.O.C.P. courses and then fail in the course, too, because it is incompatible with job and family responsibilities. We lost a high proportion of potential Amateurs at Gosford Radio Club for this very reason. The students were not in the radio or electrical business and their parents would have to abandon the project, not because they were lazy or indifferent but other pressures of quite valid natures made them give up.

7. I do not go along with you on the schoolboy argument. I have been involved in teaching almost forty years in secondary schools, tech. colleges and evening colleges. I just do not believe that school physics courses will enable a lad to sit for an A.O.C.P. theory examination. "After three years preparation, who ever?" No secondary school physics syllabus covers the A.O.C.P. syllabus, although some electronics topics are included, together with some elec. and mag. and Ohm's law. I am not at all convinced that students would be covered and learned adequately in an evening prior to the examination. At the Gosford Radio Club we went through the regulations course over a period and made sure that the material was well understood and understood and the students certainly not posted up on evenings. We ran regular regulations tests for a long time before the actual A.O.C.P. examination and there was need for revision and correction and discussion over a period of weeks. Perhaps the N.S.W. people might not be so mentally acute as those enjoying the bracing cool VK3 climate! Anyway, the chaps who did succeed in passing the

A.O.C.P. under the Club conditions are unanimous—repeat unanimous—in their opinion that a Novice licence would have benefited them earlier in the course. They have also indicated that in their opinion more chaps would have stuck with the Radio Club if it became a Club and Institute members if they could have enjoyed the earlier incentive of Novice operating. Furthermore, I cannot recall any of the Club-trained A.O.C.P. men who has ever had a c.w. licence in the Gosford area. They stood no chance to get their 12 w.p.m. exam then threw away their keys and operated solely on phone. If they could have come in via the Novice (c.w. only) gate to Amateur Radio there is no doubt that they would have gained and retained Morse skill which they certainly do not have now. I often wonder just what would happen if the P.M.G. ever decided to call in all Amateurs to take a repeat c.w. test. As far as the opinion of Mr. Hunter, manager of A.R.A.L., is reported by other American sources indicates that a chap who gains his General (equal to A.O.C.P.) licence after Novice experience is a better operator in Morse and generally know-how than the fellow who swots him and gains directly the General class level. Remember, too, as a matter of interest, that the U.S.A. Novice passmark is 74%.

8. Re the use of 160 m. band. The list of frequencies attached to the Novice Committee's Report has been signed off and contains helpful criticism. The opinion here in VK2A is that 160 m. is not used adequately in this State and that there would be room for some Novices thereon. A further point is that Novices could be restricted to other restricted operating hours. After all, the Novice system would—we hope—produce more School Radio Clubs with licensed members so that there could be inter-school contacts on 160 m. during hours when the majority of Amateurs are still at work or on the way home. Perhaps Novices might be allowed to work on 160 m. till (say) 5 p.m. or so. The principle of restricted operating times is well established, as many Amateurs have better conditions applied by the Radio Club from time to time in order to avoid b.c.l. and t.v.i. In any case, why should the competent Novice be debarred from enjoying the DX which the old-timers appear to be enjoying on 160 m. After all, the A.O.C.P. man would be using his 160 m. band while Novices make the 10 watt Novice operate elsewhere. Again, assume that an experienced Novice builds up his Morse skill to (say) 20 w.p.m. well above the average A.O.C.P. man. Isn't he entitled to get some of the good things that Amateur Radio offers?

9. Re the handicapped persons business. I reiterate that the Committee had every right to bring this matter to the Federal Executive's attention. It is not as though the handicapped movement could do far more than it has ever done before. I know that there are some isolated cases where handicapped people have enjoyed Amateur Radio, but the "thing" has never been encouraged and any change in Institute policy. We have lost much of our public service functions as Civil Defence and other services have moved into the emergency fields of communications and here—in helping handicapped people—the Institute policies have been of gaining recognition for the W.I.A. and the Amateur Service in general. The training of handicapped people to Novice level would be far easier than attempting to bring them a Full A.O.C.P. standard. Hence, we could create a wider coverage than the present licensing system affords. Also, the government authorities who are responsible for caring for handicapped people would, undoubtedly, regard any such programme with favour. The W.I.A. has been instrumental in its efforts to retain the allocated frequencies, which are threatened by lack of usage and envious eyes of commercial interests. In this statement I am merely repeating what has already been stated by our W.I.A. leaders in A.R.A.L. and elsewhere and not presenting some VK2A crackpot idea.

10. While the Committee resents some of Ron's "cracks" suggesting that we may have suppressed some anti-Novice statements—which is true—it has not done so for purely really useful points for discussion in his letter. It is a pity that he and others of anti-Novice persuasion did not take the trouble to submit their opinion to the Committee in response to my letter to A.R.A.L. asking for statements *in favour* and *against* Novice licensing. You may be interested to know that of all the statements submitted to the Committee either in writing

or verbally prior to the compilation of the Novice Report—only 10.4% were anti-Novice. The remainder were in favour of the introduction of this form of licence. Some of these pro-Novice statements were submitted by Radio Club members and therefore may be regarded as being on the "Novice" side of the argument. Most of the anti-Novice arguments submitted were pitifully weak and were not backed up by any logical reasoning. We have been guilty of presenting a Report in favour of Novice. What else could we have done when only 10.4 of the statements opposed the Novice principle? Your own Federal Councilor, very bright young man indeed—stated according to the minutes of the Brisbane Convention that he found the Report to be less biased than he thought it would be.

11. My word, I have filled up some space haven't I? Put it down to youthful exuberance and excessive enthusiasm. I have just retired on medical grounds from the teaching service with Sir Edmund Denison and am slowly finding the strain drift away. It is a hard job under present conditions in our schools and things will be worse in 1972. However, I am now in a position where I can contribute more to Amateur Radio and help out the air for about five years. I have ordered a s.s.b. transceiver (a FT200) and should take delivery on 16th of this month. It will be pleasant to chat with old and new—acquaintances on the air and to exchange ideas.

I have just been advised by the Secretary-Manager of the W.I.A. that the Novice Committee is to be re-activated and will be expected to make a Supplementary Report based on submissions received since the original Report was submitted to the Executive Committee. It is now up to both sides to let the other know the arguments presented for and against—not just bald statements but well-reasoned arguments of debating quality. As this is a committee set up by the W.I.A. I presume that the correct channel would be through the Divisional Councillors, in your case, Dr. Blackman. Did you see his t.v. broadcast re the Apollo Moon Landing? Very well done. One of the fascinating things about Amateur Radio is the wide range of people involved—from bright young men like Deane Blackman to aged and wornout school teachers! I note with interest your date of licensing. Beat me by two years, but I'll bet you have had a lot more operating time than I have. Regards and thanks again for your contribution.

—R. C. Black, VK2YA,
(Chairman, Nov. Cttee)

Editorial note.—Future correspondence on Novice licensing should be short and succinct to achieve publication.

A CASE FOR A LOWER GRADE OF AMATEUR LICENCE

Editor "A.R.A.L." Dear Sir,

Much has been written or not written on the subject of Novice licensing. It is not left to me to say what has already been said in regard to details such as frequencies and power, but rather to emphasise reasons why a lower grade of licence should be made available.

There are many reasons for promoting further Amateur activity—a valuable leisure pastime, a national training ground for electronic personnel, the continuation of researches which have been conducted by the Amateur fraternity over the years, and to justify the holding of frequencies at the face of commercial needs for additional space.

There is a need in Australia, not so much for more highly trained theoretical engineers, but for a large body of versatile, technically competent people which Amateur Radio satisfies best to form.

Australia faces a competitive situation in South-East Asia. As an example, Japan has encouraged basic licensing, no doubt realising its value in basic training. Japanese figures show approximately three times as many Radio Amateurs on a comparative population basis as compared with Australia. It is not suggested that we in Australia should be a "slave to fashion" and follow the examples of other countries, but that we constructively meet the pros and cons of a lower grade of licence as it would affect our circumstances here.

The Australian need is to be in a position to compete in a world where technology is largely controlled by electronics. It is essential that Australia be not only a country which supplies raw materials for processing elsewhere, but has enough technical ability to "row its own boat".

A need exists particularly for young experimenters to have contact with more experienced persons to avoid wasting situations that they cannot handle, and to encourage at

least a proportion of these into professional electronic careers.

A sub-committee of the Eastern Zone of the Victorian Division of the W.I.A. wishes to submit that the time has now arrived for filling the large gap between the raw beginner and the existing high standard expected of the present A.O.C.P. holder.

The term "Novice Licence" has been commonly used, but it is unfortunate in that it implies a low standard—an alternative name should be investigated, such as "Restricted Licence"; the reasons for this will be clarified below.

An examination for Restricted Licence should ensure that the holder is proficient to the normal standard, but only in those fields that he will use in his Amateur activities. It is suggested that the A.O.C.P. examination paper be divided into sections involving perhaps one and a half hours, to include power supplies, crystal controlled c.w. transmitters, simple receivers for c.w. operation, and aerials. Restricted applicants would only attempt this first section. An A.O.C.P. applicant would also be required to do this section, and in addition follow on with a further section covering the more advanced technical topics until the time of two and a half hours had elapsed.

To prevent Novice sections of the bands becoming areas of low standard operation, there seems to be little merit in restricting frequencies other than from around 14 MHz to generally accepted frequency at which phone operation normally commences.

The question of pirate operation looms as the largest cloud on the horizon in the minds of many, whence cancellation of a short-term licence will leave the operator with no equipment in the hands of an unlicensed operator. However, this committee favours making a Restricted Licence a continuing one. The standard of the examination should equip the Restricted holder to compete in contests from a technical viewpoint on c.w., whereupon there is no justification for a time restriction. Older persons or students should not be forced into full A.O.C.P. standard by a time limit on their Restricted licence application.

Restricted licensing should encourage constructional work by reason of the simplicity of equipment involved, thereby discouraging the growing and disquieting trend towards commercial parts and the interests through which the operator may have negligible understanding.

With a firm foundation of Restricted licence operation, there would be adequate incentive for most persons to proceed to A.O.C.P. standard.

—Victorian Eastern Zone, W.I.A., Novice Licensing Committee.

T.V. PIONEERS

Editor "A.R." Dear Sir,

I have just heard of the death of Tom Elliott VK5KEM. I am sad at his passing. He was indeed a pioneer amongst Amateurs and he will be well remembered for his accomplishments.

However, over the years he has been credited with transmitting the first television images in Australia in 1935; in fact, a bronze plaque on the Observatory in Wickham Terrace, Brisbane, used to attest to this.

In view of recent publications on the subject, the Brisbane City Council, on advice from the Historical Society of Queensland, have changed the wording on the plaque from "The First Television Transmission in Australia" to "The First Television Transmission in Queensland".

This is now in accordance with the facts as they actually occurred. That plaque was the first demonstration of television in Australia took place in Melbourne on 10th January, 1929.

At that time I was operating Amateur station ZII and was also in charge of the development of the equipment and the picture transmissions, so my efforts predate Tom's by almost six years.

My interest today is to pay tribute to a true pioneer and at the same time set the records in order.

—Gil Miles, VK2KI.

BOOKS BOOKS BOOKS

For the Radio Amateur for study — reference — updating

Write to your Division for latest lists or send an enquiry to Federal Executive, P.O. Box 67,

East Melbourne, Vic., 3002

A MEMBERSHIP SERVICE

LIMITED LICENSEES

Editor "A.R." Dear Sir,

In the August issue of "A.R." was a reply by the Federal President of the W.I.A. to an anonymous letter concerning Limited Licences. The most noticeable thing about this reply was the rather pernicious repetition of the title "Mr. A.R.". This is not the first time a person wishes to make a point while remaining anonymous, that is his prerogative. In fact, the desire to do so must be taken at least partly as a reflection on the organisation to which he is writing.

Having criticised the manner of Michael Owen's reply, I would like to disagree with its matter. If the Institute is so interested in Limited Licences, why does it deliberately discourage them from participating in the R.D. Contest? The rules of the Contest are such that the v.h.f. operator cannot help his State's score more than by making the five contacts needed to enter a log. In VK5 to lead considerably less attention on six metres wasted a week-end this year in 20 odd points I wonder how many of these will bother next year?

—Alan Jamieson, VK5ZPJ.

[The 1971 Federal Convention dealt with changing the rules of Contests due to the transfer of the Radiogramming Committee. The former referred to repeat contacts after specified periods, the latter formalised the transfer of the Federal Contest Committee from VK5 to VK4. It is reasonable to assume that future 24-hour contests will include these provisions.—Ed.]

R.D. CONTEST, 1971

Editor "A.R." Dear Sir,

Was it wrong or was this year's Contest among the best yet as far as friendliness is concerned?

One always meets old friends in the R.D. Contest, to my mind the best Contest I have experienced as an Amateur, both of one's own State and of the v.h.f. and I was not disappointed this year.

Brisbane and further north areas operators were not very happy about 80 metre band conditions as the band was virtually out of use all year. VK4 and VK5 operators were over S.E. Queensland soon after the Contest started and I quit with lightning around the antennas.

I did not hear any 15 metre signals from my QTH, but logs will tell the story on this band. On 15 metres, VK9 was going great guns with southern States that I could not hear late Sunday morning.

Should we nominate a calling time for the 10-metre band? Say, late Sunday morning.

To those who entered to win, for themselves or their State, I wish you good luck and good scoring. To those who came on to help make it a good contest, thanks a lot, your efforts are appreciated. Let your Federal Councillor, or me, have suggestions for making this Contest better.

I hope to hear you next Remembrance Day Contest and spare a thought for those who are not with us.

—Peter Brown, VK4JP,

Federal Contest Manager.

OBITUARY

W. ("SKIPPER") SCHOFIELD, VK6WS

In Perth on 4th August, 1971, William ("Skipper") Schofield, VK6WS, aged 95 years, a very old timer, passed away.

His interest in radio commenced in 1925 when he purchased a then newly released "Concor" kit-set broadcast receiver, and successfully completed its construction. He later joined the W.I.A. as a student member, attended the A.O.C.P. classes, and then in the sixties, served his amateur Radio licence with the call sign VK6WS. He participated in the administration of the W.A. Division for a number of years, and was also a leading light in the Subiaco Radio Society, later the Radio Society of W.A.

Although fit for the latter years of his life, he remained an active operator with the assistance of Amateur Friends who maintained his equipment in rate and operational order, until, due to ill health, when infirmity prevented further activity.

He was also a prominent yachtsman and member of the Royal Perth Yacht Club, hence the affectionate sobriquet "Skipper". Many W.I.A. members have happy memories of week-end excursions on his ocean-going cruiser.

To his relatives, the members of the W.A. Division extend their sympathy.

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VK1VB-V. F. Burman, 140 Badimara St., Warananga, 2611.

VK1ZAP—F. P. Blight, 1 Praed Pl., Garvan, 2605.

VK2ATX-N. G. McAlpin, 155 Hull Rd., West Pennant Hills, 2125.

VK2BBSZ-T. E. K. Southwick, 55 Duntroon St., Canterbury Park, 2183.

VK2ZDE-G. C. Dunkley, 8 Chambers St., East Maitland, 2323.

VK2ZGT-R. C. McGregor, 44 Kools Ave., Killara, 2171.

VK2ZJG-C. G. Young, 18 Vernon St., Hunters Hill, 2110.

VK2ZIMI-M. K. Morris, 69 Roux St., East Maitland, 2323.

VK2ZYQ/T. A. Young, 5 Grant St., Tamworth, 2340.

VK3QZW/T-D. M. Badcock, 17 Helen St., Cardiff South, 2265.

VK3ZWG-G. J. West, 17 Huntleys Point Rd., Huntleys Point, 2111.

VK2ZYR—R. G. Beech, 146 Harrow Rd., Auburn, 2144.

VK3CC-M. S. Pearce, 118 Plenty Rd., Burndooran, 3083.

VK3QZ-Q. G. Colley, Station 28 Charles St., Traralgon, Postal: P.O. Box 115, Traralgon, 3844.

VK3WI/R1—Wireless Institute of Australia, Victorian Division, Station: 140 Neil St., Carlton, Postal: P.O. Box 478 Victoria Pde., East Melbourne, 3002.

VK3AAC—C. J. Dodd, 8/19 St. George's Rd., Armadale, 3143.

VK3BDH—D. G. Dunn, 3 Allfrey St., East Brighton, 3186.

VK3YFZ—M. D. Daly, 9/105 Willesden Rd., Oakleigh, 3166.

VK3YGP—L. T. A. Pearson, "Jubilee Cottage," Main Rd., Campbell's Creek, 3451.

VK3ZV—V. V. Vezzani, 1990 Heatherton Rd., Noble Park, 3174.

VK4JAD—J. M. Donnini, 33 Alice St., Atherton, 4863.

VK4QS—Sayers, 6 Robinson St., Belgian Gardens, Townsville, 4810.

VK4RC—Redcliffe Radio Club, 12A Savannah St., Redcliffe, 4020.

VK4UZ—K. H. Burton, 11 Rocke Rd., Oxley, 2040.

VK4WI/R1—Wireless Institute of Australia (Queensland Division), Station: Mt. Mowbray, Postal: Box 638, G.P.O., Brisbane, 4001.

VK4WI/R2—Wireless Institute of Australia (Queensland Division), Station: 31 Haig St., Paddington, Townsville, 4810; Postal: Box 638, G.P.O., Brisbane, 4001.

VK4ZKL—A. H. Blake, 15 Kilby St., The Gap, 4000.

VK4ZKC—G. Gladstone, 51 Wambool St., Bulimba, 4171.

VK4ZPJ—P. J. Evans, 118 Alura St., Eskbin, 4121.

VK5LW—E. Thomas, 115A Angas Rd., Westbourne Park, 5041.

VK5QZ—M. Wolcott, 27 North St., Collingwood, 3061.

VK5ZAS—J. M. McKenzie, 319 Esplanade, Henley Beach, 5022.

VK6KG—J. A. Ferguson, Station: Cr. Kilian and Moyson Sts., Kalgoorlie; Postal: P.O. Box 588, Kalgoorlie, 6430.

VK6SV—R. G. Pledgell, C/o. T.V. Station, Kangaroo Island, 7633.

VK6ZP—F. W. Bird, Flat 5, "Kallinay," 5 Welshpool Rd., Bentley, 6102.

VK6ZKG—K. H. Gates, Station: O.T.C. Tracking Station, 1000 Pitt St., Sydney, Postal: P.O. Box 348, Carnarvon, 6791.

VK7RD—R. G. Reid, 20 Elboden St., South Hobart, 7000.

VK7ZN—A. N. Richardson, 69 George Town Rd., Launceston, 7250.

VK8VJ—C. M. Smith, 3530 Byrne Circuit, Moil, Darwin, 5794.

VK9HL—R. R. Hooper, P.O. Box 251, Lse. T.P.N.G.

ALTERATIONS

VK2WC—W. M. Cunningham, 3 Hastings St., Wauchope, 2446.

VK3BV—H. Fitzpatrick, 4 McIntyre St., Hamilton, 3300.

VK3FO—T. C. R. K. Gibson, Spring St., Maldon, 3463.

VK3HI—F. A. J. Forse, 8 Merrick Cres., Glen Waverley, 3150.

VK3QO—D. L. Bellair, Flat 8, Debondy Crt., Lower Plenty, 3083.

VK3SL—M. L. Brane, 43/6 Williams Rd., Windsor, 3024.

VK3SZ—S. I. Zeunert, Lot 274, Swift Dr., Glen Waverley, 3150.

VK3XU—J. R. Oxley (Rev.), 48 Suffolk Rd., Surrey Hills, 3127.

VK3AHF—R. Morton (Dr.), 152 Hearn St., Colac, 3250.

VK3AJH—J. R. Handley, 35 Bulla Rd., North Essendon, 3041.

VK3AJ—J. R. Mallorran, 67 Macedon St., Subiaco, 6008.

VK3AQ—K. J. Echberg, 18/77 Alma Rd., St. Kilda, 3182.

VK3AS—Midlands Experimental Radio Club, Station: Flora Hill, Bendigo; Postal: Bendigo Institute of Technology, McCrae St., Bendigo, 3550.

VK3AZM—D. L. Godfrey, 122 Nelson Pl., Wilmot, 3016.

VK3BEV—D. L. Stoeck, 80 Moga Ave., East Kew, 3042.

VK3VYAP—R. E. Fouldock, 26 Sturt St., Armadale, 3142.

VK3YBA—M. Skop, 12/68 Alma Rd., East St. Kilda, 3182.

VK3ZDQ—B. J. Treloar, 4 Ash Crt., Mulgrave, 3170.

VK3ZGT—L. N. Tate, 6 Bindy St., Wantirna South, 3152.

VK3ZH—P. J. Blake, 10 Sheffield St., South Caulfield, 3162.

VK3ZKL—A. Slamian, 72 Carronvale Rd., Mooroolbark, 3138.

VK3ZVK—N. Hill, 4/444 Glenferrie Rd., Koonung, 3144.

VK4CN—J. W. J. Jackson, 12 Colleen St., Lavington, 3501.

VK4HY—H. Varnies, 13 Empress St., Toorwoomba, 4350.

VK4ZAJ—A. S. Millard, 15 Murray St., Red Hill, 4059.

VK4ZDM—D. W. McGrath, 4 Stanton Tee, Townsville, 4810.

VK4ZHM—J. L. Barnes, 1/30 Russell St., Townsville, 4810.

VK4ZKT—K. H. Tietze, 1420 Gympie Rd., Aspley, 4034.

VK5AL—S. K. Harris, 26 Offer Ave., Bellevue Heights, 5050.

VK5FP—B. A. Park, Bradbury Rd., Mylor, 5153.

VK5OT—T. M. D. Sobels, 8 Valiant Rd., Holden Hill, 5068.

VK5PC—D. Greig, 1993 McDonnell Ave., West Hindmarsh, 5067.

VK5SEU—N. G. Scott, P.O. Box 455, Loxton, 5333.

VK6DE—A. W. A. Storm, 123 Hastings St., Scarborough, 6019.

VK6JL—J. L. Lewis, C/o. Government School, Yuma, 5532.

VK6TR—W. B. Reed, 2 Roche Rd., Sorrento, 6020.

CANCELLATIONS

VK5ZET—T. J. L. Jones, Transferred to S.A.

VK5ZET—R. J. Gregory, Transferred to Vic.

VK5ZMV—M. H. Adams, Transferred to Vic.

VK5ZOE—L. N. Smith, Transferred to Tas.

VK5ZTS—T. K. Southwick, Now VK3BBSZ/T.

VK3BP—D. J. Terrell, Transferred to N.S.W.

VK3BP—D. J. Falster, Not renewed.

VK3WU—J. W. Morrison, Not renewed.

VK3XT—G. F. Miller, Not renewed.

VK3AAK—H. A. McLachlan, Not renewed.

VK3AAC—H. N. Charles, Not renewed.

VK3AGW—P. D. P. P. P. Not renewed.

VK3AGW—L. Woolf, Not renewed.

VK3AGZ—J. G. Colley, Not renewed.

VK3ASB—T. S. B. Roberts, Not renewed.

VK3ASB—G. J. Green, Not renewed.

VK3AUT—A. U. Magnus, Not renewed.

VK3BDT—R. D. Turner, Not renewed.

VK3ZDE—R. A. Ellis, Not renewed.

VK3ZTC—A. N. Richardson, Now VK3ZNR.

VK3ZTC—A. N. Richardson, Transferred to N.G.

VK4FU—D. M. West, Deceased.

VK4PV—P. E. Barker, Not renewed.

VK5VV—Wireless Institute of Australia (Qld. Div.), Now VK4WI/R1.

VK4ZRS—R. Sayers, Now VK4QS.

VK5RV—D. E. Lyons, Not renewed.

VK5ZBK—E. J. Kenny, Not renewed.

VK5ZDQ—E. J. Patching, Not renewed.

VK5ZEM—C. F. Modistach, Not renewed.

VK5ZFI—G. E. Thomas, Now VK5LW.

VK5ZFI—G. M. McCarthy, Not renewed.

VK6GDY—F. H. Smith, Left country.

VK6JV—J. Vogel, Transferred to T.P.N.G.

VK6ZAU—W. R. Cooper, Transferred to Fijl.

VK6ZJH—T. J. L. Harrison, Now VK6WA/T.

VK7BN—W. N. N. Nisbet, Not renewed.

VK7MB—A. C. McBurnie, Not renewed.

VK7MB—A. C. McBurnie, Not renewed.

VK7ZAK—P. E. Blundstone, Not renewed.

VK7ZOR—R. G. Reid, Now VK7TRD.

VK8KRN—R. W. H. B. Jones, Transferred to W.A.

VK8KBT—R. D. Trickett, Not renewed.

VK8QC—R. H. Mould, Not renewed.

VK8SLB—J. B. Leibgold, Not renewed.

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N.S.W.: General Equipments Pty. Ltd., Artarmon. Phone: 439-2705.
S.A.: General Equipments Pty. Ltd., Norwood. Phone: 63-4844.
W.A.: Australian Electron's Services Pty. Ltd., Morley. Phone: 75-3858.
N.T.: Combined Electronics Pty. Ltd., Darwin. Phone: 6681.

VHF

Sub-Editor: ERIC JAMIESON, VK5LP
Forreston, South Australia, 5233.
Closing date for copy 30th of month.
All Times in E.S.T.

AMATEUR BAND BEACONS

VK0	51.000	VK8VE, Cobar.
	53.032	VK5LPS, Macquarie Island.
VK3	144.700	VK3VE, Vermont.
VK4	144.390	107m, west of Brisbane.
VK5	53.000	VK5VFM, Mt. Loft.
VK6	144.100	VK5VFM, Mt. Loft.
	52.900	VK6TWS, Rockingham, Perth.
	52.900	VK6TWS, Carnarvon.
	144.500	VK8VE, Mt. Barker (Albany).
VK7	144.900	VK8VF, Bickley.
VK9	144.900	VK7VTF, Devonport.
ZL1	145.100	ZL1VHF, Christmas Island.
ZL2	145.200	ZL2VHF, Auckland.
ZL3	145.300	ZL3VHF, Wellington.
JA	50.590	JA1GTY, Japan.
W	50.590	WB1R, U.S.A.
HL	50.100	HL8WI, South Korea.
ZM	30.100	ZK1AA, Cook Island.
KH6	50.101	KHE5QI, Hawaii.
	50.015	KHEERU, Hawaii.

There are no changes to the beacon list this month. It is noted with interest that a beacon soon will be operating in Tasmania, and that one has been licensed for operation. Toowong using the call sign, VK4WL2, probably operating on 52.4 MHz. This call sign is unusual to say the least, but I guess there are valid reasons for its use. However, don't make the mistake of thinking it will be an interesting portable from VK2! (Maybe a repeater, should be /HZ-Ed.) Leigh VK6WA2 mentions that two solid state beacons to run 50 watts are being constructed in Toowong to replace their present beacons. It is planned that they will be about 200 feet up the mast of TVW3, and will be about 1,000 feet a.s.l. with a good path east and west. The present 6 m beacon in Perth is apparently running satisfactorily, but the 2 m beacon is only giving a low power output at present.

Bob VK3SCA sends along his usual notes and the following extracts from his letter: "By the time these notes are read, Ken Moore of VK3, will have taken up residence in Albany, W.A., as an engineer with the P.M.G. Dept. He has indicated he will be very keen to work in the Eastern States on 144 MHz., and very willing to try his hand at what would be required to use s.s.b. It will take him awhile to set up his station, so he may not be able to make it in time for the coming DX season, but could be sometime to keep an eye on the following year. Those of you growing rays for all bands, it is quite obvious the path is open on 144 MHz. from west to east much more often than previously imagined, so with somebody keen to do business at the western end, there will be plenty of time for the other stations."

"The Remembrance Day Contest was well supported on the v.h.f. bands in VK3, Bob himself scored 122 points, and he said there were quite a few with scores around 50 to 60 points. About 12 or so stations really tried this year."

"On the subject of Contests, a computer programming is being undertaken in Melbourne to establish a table of distances for use in compiling the scores for the Ross Hult V.H.F. Contest. This will be produced in the square table format, and currently covering 49 Australian towns, and later expanding to 58 towns. This should help entrants to more readily ascertain the distances between many of the better known or more active areas. An advance copy is to be sent to VK4IP and it is hoped to publish same in 'Amateur Radio' for all to use."

"John VK4ZB is now running the legal limit on s.s.b. on 144 MHz. from his home in Brisbane and is looking for contacts to the south into VK3, 4, 5 and 6 for the coming DX season. This path has not been exploited very much of recent years due to lack of suitably equipped stations in VK4, but John may need to be helped to overcome this situation. Although he has not mentioned it, I think John may be planning some meteor scatter experiments as well."

"For the benefit of stations planning portable operations this year, advanced notice is given that Alan VK5BW proposes operating from Mt. Bryan, 10 miles N.E. of Adelaide, on Saturday and Sunday, 4th and 5th December, on 52, 144, 432 and 1290 MHz. plus h.f. for liaison purposes. This week-end is the date of the annual VK5 V.H.F. Field Day, and also

coincides with a VK3 V.H.F. Field Day." Thank you Bob for your helpful information once again.

The second issue of "The Victorian V.H.F.er" has come to hand and is another excellent coverage of VK3 activities. Geoff VK3AMK, a very active v.h.f. operator, has a lengthy letter including several photographs on the band planning ideas for 144 MHz. His table of band division is interesting enough to bear repetition here, and is as follows:

144.000	to 144.025	-CW and FSK; for EME and MS.
144.025	to 144.100	-CW; for CW only.
144.100	to 144.300	-AM and SSB; exclusive voice
144.300	to 144.900	-CW, AM, SSB, NBFM, MCW, FSK; general operation.
144.900	to 145.000	-CW and FSK; for beacons.
145.000	to 145.500	-CW, AM, SSB, NBFM, MCW, FSK; general operation.
145.500	to 146.500	-FM; simplex and repeaters.
146.500	to 148.000	-any permitted mode; general operation, satellite, experimental, etc.

Geoff makes the following points amongst others: "... consider that the idea of allocating others the entire 500 MHz. is not so good or DX/city basis is really no longer valid. This may have had considerable merit in the days of almost exclusive crystal locked operation. However, with the ever increasing use of v.f.o. and transverters, operation on modes not used now, certainly in the near future, will operate on the frequency of the station they are working. This is much preferable to the split frequency idea as weak stations are definitely more likely to be heard by the stations they are calling, rather than being a faint signal perhaps anywhere within 1 MHz. or so. Calling on the stations' transmitting frequencies also solves the problem of the weak signal from the stations who are unaware of the presence of weak DX on or near their operating frequency."

1. A clear 25 KHz. for EME and Meteor Scatter only.
2. 75 KHz. for CW only. (This would be very valuable for serious long-haul DX work.)
3. 400 KHz. for AM and SSB only. (Free of NBFM and some of the not so narrow hand FMI!)
4. 400 KHz. for general operation up to 144.900.
5. 100 KHz. for beacons exclusively."

The full text of Geoff's letter may be read in "The Victorian V.H.F.er" but the above is a sufficient lead in to set you thinking on the matter.

From Brian VK5SCA comes a very brief word of advice after a contact recently on h.f. with JA1RNJ to the effect that VK stations are being heard in Japan with much greater regularity than M.W. stations. This may be due to being erect, and suggest more observations with the beams pointing north may bring fruitful results. The next move is yours!

SCATTER SIGNALS

Quite a lot of interest has been centred on meteor scatter signals of recent times and the excellent article by Wally VK5ZPFW in "The Radio Teur" August 1971 tied up the loose ends with the result more may try this form of operation in the future. However, there is another form of scatter signals which may prove those prepared to try the sport, and the following article will help to fill you in on the requirements. It comes from the V.H.F. News in "Break In" of the N.Z.A.R.T. Issue July 1971:

"During the postwar period high power transmitting tubes and better receivers gave vastly increased capability to persons interested in providing reliable transmissions over long distances. An early experiment by the Collins Company showed that satisfactory signals were possible on 50 MHz. and the following article will help to fill you in on the requirements. It comes from the V.H.F. News in "Break In" of the N.Z.A.R.T. Issue July 1971:

"In this mode weak signals are present over long paths to give reliable communication independent of atmospheric and seasonal variations. The equipment required is the best possible receiver, the largest aerial and the highest power available.

"Depending on the frequency, there are two modes of scatter. On the low bands (less than 100 MHz.) the E layer is used. This lies below the 60-mile height and extends down to 40 miles. The slight reflections produced in this layer are not strong enough to be usable at a distance of 500 to 2,000 miles. Because of the weak signals at the receiving end, various methods have been used to improve the links.

These include low noise front ends to the receiver, high stability transmitters and receivers, dual diversity reception including both antennas and frequency.

"The scattering area is a variable parameter, this means that multipath reflections will occur and fading will result. All types of fading will be experienced. There will be short-time and long-term effects on the signal varying from 10 e.p.s. to several hours. Some distortion and frequency selective fading will be experienced. One paradox is that a large antenna shows a lower minimum signal than a smaller one, but the latter is better, however. The explanation is that the signal from a given scattering volume could be attenuated by a highly directive antenna if this was not correctly aligned compared to a less critical antenna in a random pattern. With correct interception the signal is higher.

"In the case of tropospheric scatter in the u.h.f. region a similar situation exists. The scatter is occurring at a higher level and this gives a much shorter range. The maximum being between 100 and 500 miles in this case.

"All this appears to point the mode beyond Amateurs, however, there is one advantage that we have, and this is the non-essential nature of our communication. This means that high reliability and 100% communication are not necessary. Because of this, the mode becomes possible providing one is prepared to lose some of the reliability. Using this analytical, the following gives some idea of the possibilities. It can be shown that it is almost impossible to receive all of the signal. Likewise it is almost impossible to miss all the signal. This is particularly true by finding the average signal and comparing a fade with it the following will be observed, that the deepest fades are for the shortest time while the shallowest fades occupy the most time. To receive all of the signal is not satisfactory by using diversity reception. For Amateur purposes FSK, CW, SSB should be satisfactory. Coding of signal reports as in moon bounce may be advisable.

"By using the graphs in Orr and Johnson as a guide what to expect it would appear that a receiver with a 1 KHz. bandwidth and a 3 dB. noise figure will cover a range of 200 miles with a 5 element yagi at each end. When the antenna is in the 20 dB. range the distance increases to 350 miles and another 100 miles can be obtained if you have the de luxe model with several hundred elements.

"By applying a kilowatt to the feeding one cannot obtain 50 miles increase. This totals 500 miles. To get a further 500 miles only requires 15 dB. more signal at either the receiver or transmitter or combination. It can be thus deduced that a fully operational moon bounce station should be able to bridge the gap."

So there you are. The possibilities do exist. However, I would imagine one of the difficulties in a city area would be the rather high existing noise level, but then again, M.S. contacts have been made with prevailing noise levels. For those of you who are interested for fresh air do not select a partner in another State and get moving!

COMING EVENTS

In an effort to keep the nation informed on forthcoming v.h.f. activity, there seems no reason why just a listing of events in the v.h.f. bands could not be included in the events Calendar printed elsewhere in this issue. Information to be included will be that of a national character, covering such items as V.H.F. Field Days, contests and amateur concentrated efforts by a person or group with a view to promoting activity over a wide area. Publicity officers of the various V.H.F. Groups and kindred organisations are invited to send to the editor details of the coming events, with a brief outline of what they involve. The first listing in the months to follow up to the event will show only the date, what it is and where it is being conducted.

Information for inclusion in the general notes must be in my hands by the 30th of the month to be included in the following issue. Please note that copy for the January issue must be available by 25th November, five days earlier than usual.

A reminder to those who have qualified for the awards in the last issue. Award applications must be in the hands of the Awards Manager by 31st Dec., 1971. To save a last minute rush what about getting the job done now before the DX starts coming through?

That's all for this month. I leave you with the thought. The greatest happiness of life is the conviction that there is something worth doing and it is possible to do it.



By H. F. EVERTICK

C/o. P.O. Box 36, East Melbourne, Vic., 3002
(Times are in G.M.T.)

The response to appeals for help in compiling this column are coming in well from old friends. More is needed than please. Every effort is being made to make this column current and useful. If a rare DX-pedition comes up after this article is written but before it is read the only piece of useful information may be the QSL address.

ITALIAN PREFIXES

The A.R.L. advises that the prefixes now in use correspond approximately to the regions and are:

- IPI—Piemonte, Liguria, Valle d'Aosta.
- 12—Lombardy.
- 13—Veneto, Trentino, Alto Adige, Friuli—Venezia Giulia.
- 14—Emilia.
- 15—Tuscany.
- 16—Marche Abruzzo.
- 17—Puglia Basilicata.
- 18—Campania, Calabria, Molise.
- 19—Sicily.
- 10—Lazio, Umbria.
- 18—Sardinia.
- IAS—Tuscan Isles (Elba, etc.).
- IIS—Ponza Isles (Ponza, etc.).
- IIS—Naples Isles (Capri, etc.).
- ID—Isle of Elba (Filicudi, etc.).
- IH—Ustica Isles.
- IP—Egadi Isles (Favignana, etc.).
- IC—Filaria Isles (Lampedusa, etc.).
- IH—Panzerella.
- IL—Principina Group.
- IM—Small Sardinian Isles.

However existing licensees can retain their II (ITI or ISII) calls.

Venezuela—AM4 prefixes to mark 150th Independence to 31/12/71.

Rarer Calls (mainly s.s.b. 14 MHz). VK-SAXQ finally worked Jim ZMTAG after seven

months of dog-piles and in his lists included VK0TM (one 3WPM), VK1BHD (two 4WPM), VK5M and VK5NA. VK3JF worked Gang Is. VK5MWT and will have been looking out for 4J0BJ and 4J0DI DX-pedition on s.s.b. to Sakhalin. It is by UW3BZL on c.w. JDIACE on Bonita Is. VK5KX measured 2ZEP/C and was here on Chatham Is. until next Feb. working c.w. and a.s.b. most bands, that the 7 and 3.5 MHz bands held his interest for long periods and a few of his more exotic ones (made on c.w. and included ZD9A, NIO, SWL, South Pacific, 9G1PF, FOOTG, HB4PF). Murray also comments that Commonwealth Reply Coupons may go out of fashion with the increased postal charges this month. Most of these operators also worked some of the stations in the QSL list (General Cruickshank, VR4CG, on the Solomons (VK-2BHC at home), is looking for contacts on 9K1HZ, most evenings).

100 METRES

Ralph WINGT will be on 1802 kHz., plus or minus 40 minutes of G.M.T. sunrise times listed on Oct. 10, 1951; Oct. 17, 1959; Oct. 24, 1968; Oct. 31, 1116; Nov. 7, 1125; Nov. 14, 1133 (VK-2BMS).

QSL INFORMATION

(Courtesy of VKs 3AXQ, 3JF, 2AXK, 4CX and 3AMP.)

FOCH/FC—HB9HTL	VRIAA—K3RLY
HB0XUD—ON4QV	ZL2PO/C—ZL2AFZ
JY—WA3HUC	ZL2AFZ/A—ZL2GX
FJ0DX—V3PV	ZMTAG—K3LY
UM8PFZ—WA3EFL	3V1AF—FS2K
VP2MF—VE3VGO	3V1ZK—FS2K
VP2VAG—VE3EGMT	4X4AE—WA3NOS
VA3VAB—V3PAK	5Z4MF—GSawy.
FX8KAA—Box 28, Noumea, Calif.	KX6DC—Box 697, A.P.O., San Francisco, 96555.
OD5SET—Box 4548, Beirut.	TZ—Box 14, Tel Aviv.
JY—WA3HUC	JV8XX—Montmore, Port Vila.
JB—WB3LLE	5WIAR—Box 721, Apia.
IP3—Durilene	5X5NF—Durilene)—VE3AKV.

QSL managers normally QSL via the Bureau although some will QSL direct against a self addressed envelope and I.R.C.s enclosed.

DX Managers: WVKX/PK3JF from Midway Is. from about 21st to 24th Oct. 1970, approx 1st and 2nd Nov. From 25th Oct. to 1st Nov. Kure Is. will be activated (but there will be some phone

patch traffic). Operators are WTKXP/KH6GMP and KH6HGP. Modes will be c.w. (1400S, 2100S) and s.s.b. all bands. QSL to KH6HGM with s.s.e. and usual I.R.C.s via cards via Bureau (courtesy KH6BZF).

Other: Roy Jonasson, VK3ND, has QSYed for six months to live where he hopes to get on as VK5DQ. QSL via VK3 Bureau (courtesy Eric L30042).

VK/ZL Contest results as printed on page 15 of June "A.R." amend JA2YF to read JA2YJF and add VK5AZLXR with a score of 960 points. (VK6ZDK).

Awards: Baleare Islands (EAS Radio Club, Box 34, Palma, Majorca). 10 EAS contacts on two bands or 7 on 3 or more bands c.w. or phone. QSL via Bureau (courtesy 17/68) certified list and 10 I.R.C.s (free to blind and paralysed ops).

72 Award—2 way c.w. or phone, any band from 10/133 to 21 JAT (not in the standard list of QSL cards and 10 I.R.C.s to N.J.D.X.C. Award Manager, Box 70, G.P.O., Sendai, Miyagi, Japan).

Five QSOs with 8 V.R.C.s and 10 I.R.C.s and mode logs to V.R.C. Box 510, Valencia, with 8 I.R.C.s (for U.S.S.I.) before 31/1/72.

Most grateful thanks to all those who have assisted with information. Are there any volunteers please to take over this column?

COOK BI-CENTENARY AWARD

The following additional stations have qualified for the Award:

Cert.	No.	Call	Cert.	No.	Call
I3B1	AXRAX	I3B1	YAIHD	I3B0	JA1KAK
I3B2	AXRBU	I3B2	YAIHD	I3B1	JA1KAK
I3B3	AXRZB	I3B3	G3MGF	I3B2	CA3AAB
I3B4	G3TKI	I3B4	PAOKA	I3B3	AX3QY
I3B5	PZ1AC	I3B5	AX5CY		

W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. Position in the list is determined by the first number shown. The first number represents the participant's total countries less any credits given for deleted countries. The second number shown represents the total D.C.C.C. credits given for included and deleted countries. Where totals are the same, listings will be alphabetical by call sign.

Credits for new members and those whose totals have been amended are also shown.

PHONE

VK5MS	319/343	VK2APK	285/295
VK6RU	316/342	VK4PJ	282/307
VK3AHO	310/322	VK4TY	284/288
VK4KS	307/322	VK4UC	275/278
VK6MK	304/324	VK2AAK	274/279
VK3AB	296/314	VK3ZE	271/274

New Members:

Cert. No.	Call	Total
119	VK5ZB	106/107
120	VK4QA	101/101
121	CI4IA	113/113

Amendments:

VK4DO	236/248	VK3STG	185/189
VK3AMK	235/235	VK3JM	143/143
VK4RF	216/216		

C.W.

VK2QL	303/325	VK3NC	273/300
VK3LQ	315/335	VK3LWX	271/280
VK4PJ	289/315	VK3LX	274/287
VK3YL	286/303	VK6RUL	265/289
VK2AP	284/292	VK4TY	259/272
VK2AGH	282/292	VK3TL	255/260

New Member:

Cert. No.	Call	Total
98	VK3LV	101/101

Amendments:

VK4DO	193/210	VK4RF	182/202
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OPEN

VK6RU	317/343	VK6MK	303/324
VK4SD	315/330	VK2APK	302/314
VK2AH	314/334	VK4PJ	301/325
VK3YL	313/335	VK3LWX	299/320
VK4KS	308/327	VK4UC	286/298
VK4TY	306/321	VK4PJ	297/323

New Member:

Cert. No.	Call	Total
136	VK5FY	108/112

Amendments:

VK4DO	251/269	VK3LV	106/106
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DIVISIONAL NOTES

NEW SOUTH WALES

In order to assist the sub-editor, T. Mills VK2ZTM, and to facilitate the preparation and submission of news to "A.R." for the VK2 column, Council has requested Mike Farrell, VK2ZNA, to organise a committee for the compilation of news. Mike requests members who would be interested in sitting on this committee and contributing from their h.h.s. and DX types, to contact him by either writing to the Institute or phoning him on 357-9332 during business hours.

Special General Meeting.—The Special General Meeting called for Friday, 27th August, was not held because of short notice given and was deferred until the September meeting night. The subject was reduced fees for student annual subscriptions.

Unfinished Members.—Notices were included in the recent Divisional Bulletin advising unfinished members of this fact. All members remaining unfinished at 31st August were removed from membership. The present subscription rates are: \$10 for Student members and \$8.00 for Associate members.

Key Section Rules.—For the Brass Pounders key section, which is presently officially known, are expected to be promulgated shortly. Until the rules are available, little can be done to get things under way. Members of the N.S.W. Consulting Committee are Bill Lewis (VK2YB), Kevin Collins (VK2ANT) and Mike Farrell (VK2ZNA).

Progress at VK2SWL.—Progress on the re-equipping of VK2SWL at Dural is continuing slowly, but we have a lot of work to do. The limiting factor in the work is lack of helpers. Members willing to assist should contact any member of Council or the Dural Committee.

Inwards QSL Cards.—Among many items discussed at a recent meeting of Divisional Council was the accumulation of QSL cards in the Inwards Bureau. Many thousands of cards have accumulated for members and non-members who have shown no interest in calling them. It was decided that all cards will be despatched in order to clear the Bureau. All cards subsequently received for non-members and for members who do not collect cards will be returned to senders.

Y.R.S. Broadcasts.—A news bulletin is transmitted monthly at 1500 E.S.T. on selected Saturdays as follows: 30th Oct., 27th Nov., and 11th Dec. Frequency is approx. 7050 kHz. Amane from VK2AWL.

Jamboree of the Air.—Any person able to assist any Scout Group to aid the Scouts' Jamboree of the Air to be held in October should contact with the Administrative Secretary (62-435795) and we will pass on your name to a nearby group.

Call Back Frequencies.—As members will recall during the last Federal Convention, VK2K was set aside as a calling frequency. With this in mind, it has been decided by Council that it would be advantageous to move our call back frequency from 7050 KHz. When these notes were prepared, the following frequencies had been tested on the exact frequency that should be used, but members may have ideas of their own on this subject and we would very much like to keep members on the running morning broadcasts, or in writing to Council. We must make a decision on this, we must bear in mind that the following frequencies are used by other Divisions for their call backs: 7085, 7095, 7105, 7115, 7125, 7135 KHz. S.A. Divisional Officer.

VK2 Club Net.—It is intended to introduce a "Club Net" to enable all radio clubs to get together and exchange information and ideas amongst themselves. When these notes were prepared, the club net had been formed as to frequency, times etc. Details are given in the Sunday morning broadcasts.

Hunters Branch.—The 1971 Westlakes Radio Club Field Day, held on 22nd August, at Teralla, turned out to be a memorable one.

The 1971 Trevor Harry Memorial Prize was awarded to the most outstanding student of the year, David Crofts of Newcastle. Y.R.C.S. certificates were presented to 16 members of the club who participated in the past three months. A continual programme of events throughout the day kept the fox hunters busy.

Hiawarra Branch.—Attendances at the monthly fox hunts held by the Hiawarra have fallen, of late, which has resulted in a change of venue.

This will now be held on the Sunday after the monthly general meeting (which is on the second Monday of each month) and it is hoped that this will improve.

The fox hunt, which is on 32.982 MHz, carries a perpetual trophy which was donated by Basil VK2AWL. The August meeting was well attended to see the latest in Yaesu equipment by Stephen VK2ZSK and associated accessories. The display was well received. (VK2FE, Pub. Officer.)

Maitland Radio Club.—At the August meeting persons present witnessed a demonstration at the club's new slide projector equipment. The projector which is fitted with a lens of the correct focal length to produce a picture the size of the motion picture screen already installed at the club, therefore the first step made by the club towards the installation of visual aid training equipment.

The first class to benefit from the visual aid training will be the new A.O.C.P. class which commenced on 4th Sept. Some classes are present advanced members of the club for the February A.O.C.P. examination.

Any interested persons wishing to gain further information about the club may do so by writing to the Secretary at P.O. Box 54, East Maitland, 2323, or phone Maitland 33-7266. (VK2ELW, Pres.)

VICTORIA

40 Metre Tx for VK3WI.—Arrangements have been made to improve VK3WI's coverage on 40 metres by installing a higher power transmitter and a new antenna.

A.O.C.P. Classes.—Saturday classes in both the theory and the Morse are being arranged. A series of feed forms for Institute members has been set. A special license rate has been introduced for Limited license members who undertake the Morse class.

Divisional Notes.—Items which could be used in these notes should be forwarded to P.O. Box 100, Melbourne, 3000 by 25th of the month. Please mark all items "Divisional Notes." (VK3AUI)

QUEENSLAND

Redcliffe Radio Club, VK3CR.—The club exhibited its amateur Radio activities at the Redcliffe Show on July 15-17 with an FT-DX-400 and a Swan 350 with one antenna, a 68kW multiband trap dipole. Next year it is hoped to improve on this and also add a 100kW antenna. Some interesting contacts were encountered and had to be overcome. We made 149 contacts with a total of 16 countries, gained five new members and created quite a bit of interest. It was a pity that the Brisbane T.V. Group was unable to come, but maybe next year we may rig up our own t.v. gear. (Anyone with a good camera c.c.t. for a s.t.v.) The club has now just over 50 members, varying in age from 12 to 61 years old, including some family teams. Our particular team consisting of dad, two sons and one daughter, travel each Monday night 20 miles to attend the Elementary Y.R.S. classes. (John VK4QA)

SOUTH AUSTRALIA

The month of August saw the major contests. The VK5 intrastate contest has now proved its popularity with good activity on the bands. The results should be known by the time of issue of these notes. The VK5DX of this year showed the further advance of s.s.b. with the very few a.m. stations finding contacts very difficult to find. Operating standard was very good generally with a few inferior signals. Vox operation enabled quite a few stations to make over 300 contacts a feat impossible not so many years ago.

The August S.A. Division meeting was a display of amateur equipment which attracted a wide range of home constructed equipment of good standard. The main award was received by Graham VK5ZOF for his Amateur Television equipment. This complex solid state gear included two cameras, video switcher with waveform monitor and converter which operated continuously throughout the meeting on the commercial monitor, was adjudged best. A very well constructed model portable receiver from Len VK5NQ received an honourable mention. Other transmitting equipment exhibited were a s.s.b. from Eric VK5EN, a six metre linear amplifier from Alan VK5ZWW, a 200 watt transverter amplifier by Bob VK5ZDX. Other equipment and test gear included an a.c.-d.c. power supply from Eric VK5LP, a vox unit from Harry VK5HN, a 10.7 MHz solid state converter from Don VK5AUI and a self-excited power meter by Neil VK5WN, an antenna noise bridge by Phil VK5NN, and a FET g.d.o. and r.f. attenuator by Rich VK5ZFO. Some of the construction ideas should be gleaned from viewing other equipment as the main benefit of these display nights, and this was no exception.

VICTORIAN DIVISION, W.I.A.

ANNUAL DINNER

will be held on

FRIDAY, 22nd OCTOBER, 1971

at the

VILLAGE GREEN HOTEL, Glen Waverley

The main business part of the meeting concerned a short progress report from the Headquarters Building Committee, heard further suggestions about details of the Novice licensing scheme, and considered several other topics of interest. The October 28 meeting will be a similar Jumbo.

The August V.h.F. Group meeting was a round table discussion on receivers and covered a wide range of subjects from cross modulation problems, L.V.L. (from recent oscillators), solar state, the effect of throughness, circuit effect of gain and bandwidth on overloading problems and similar kinds of Amateur eyeball problems. Quite a stimulating exchange of ideas. Everybody gained some help. The October meeting will be a similar discussion session on antennas.

Club council secretaries and publicity officers desiring to include their activities please contact me at the general meetings or before the 25th of each month. (VK3GZ)

FEDERAL DIRECTORY

Rooms: 478 Victoria Pde., East Melbourne, Vic. 3002 (Mon.-Fri., 1000-1700 hours). P.O. Box 67, East Melbourne, Vic. 3002.

Federal Council: VK3 2GN, STX 4ZGL, 5TY, 6ZDK, TEJ.

Federal Executive: President, VK3KJ; Vice-President, VK3SQV; Editor, VK3AFJ; Members: VK3 3ADW, NDN, JAGZ (SARZ).

Federal Manager: P. B. Dodge, VK3CIF.

Project Australis Group: Chairman, R. Tonkin, L3000, St. Co-ordinators: VK3 2RX, 4ZGL, 5NZ, SHK, 7PP.

Federal Repeater Secretariat: VK3 2ZIM (chairman), ZT2D, ZT2D, State Co-ordinator, VK3V.

Key Section: Manager, VK3TX; State Co-ordinators, VK3 2VB, 3XB, 4DP, SFP, 7LM.

Federal Intruder Watch Co-ordinator: VK3LC; State Co-ordinators: VK3 ZZQ, AI 3L0389, 4KX.

Federal Contest Manager: VK4PJ; Fed. Awards Manager, VK3JAMK; Fed. QSL Manager, VK3RJ; S.W.L. Manager, E. Treblecock, L30642; I.A.R.U. Liaison Officer, VK3GZ; Novice Licensing Committee Chairman, VK3YA.

DIVISIONAL DIRECTORY

Please refer to August issue page 15.

New South Wales: Delete references to "store" and "S.W.L. Mtg. 3rd Fri."

South Australia.—Delete all against VK5WI and replace with VK5SWI—Sun. 0630 hrs. 1815 KHz, a.m.; re-broadcast 2615 KHz, a.m. by VK5ZQZ, on 1725 KHz, a.m. by VK5M, on 1410 KHz, a.m. by VK5V, on 92.5 MHz, a.m. by VK5ZDX, on 144.10 MHz, a.m. by VK5AWS and in Mt. Gambier 2 m by VK5DKD, in Darwin 2 m by VK5CMC. B.c. offices VK5XY.

Queensland.—Add: Students' Classes Wed. 1830 hrs. 7PP.

Divisional Officers: 1971-72—Vice-Pres., add VK3TX. Div. Councillors, add VK3TX.

Zone and Club Directory.—VK7: Northern Zone at 8 High St. (Room 10), Launceston, second Friday. North West Zone at Lakeside Hall, Ulverstone, first Tuesday (see VK7MX).

CALENDAR

Listen also to appropriate Sunday Morning Divisional Broadcasts.

Oct. 15/17—Scout Jamboree of the Air.

New South Wales

Oct. 10—V.h.F. Spring Field Day at Hoxton Pk.

.. 17—Hunter Branch Field Day, Marmong Point Park from 1000 hrs.

.. 22—General Meeting—Sydney.

.. 27—Sydney 2 mx for hunt.

Nov. 5—Meetings: V.h.F. Group, Sydney; Hunter Branch, Newcastle; Central Coast, Gosford.

.. 21—Blue Mountains' Branch Field Day, at Lawson Swimming Pool—family picnic day (VK2BZK).

Victoria

Oct. 22—Annual Dinner at Village Green Hotel, Glen Waverley.

.. 23/24—Western Zone, 24th Convention at Warracknabeal (23rd) and Wyperfeld Nat. Park (24th) VK3AQX.

Nov. 5—V.h.F. Field Day.

.. 21—Midland Zone H.F./V.h.F. Rally, Lake Eppalock.

Queensland

Nov. 5—V.h.F. Tx Hunt, Kangaroo Point.

BLIND OPERATORS

How many Amateurs have contacted VK-5AWT? Did you realise that the youthful voices which you may hear on the air can be heard claim ouring more or less peacefully for a "go" at the mike are those of blind kids?

The writer paid a brief visit one night to the Burwood School of the Royal Victorian Institute for the Blind a few weeks ago and found the shack a hive of activity and excitement. The members of W.I.A. were fully rostered themselves for duty as operators at Burwood because the technical mysteries of Amateur Radio are beyond the age group which is attracted. Most of the participants attend the sessions in night attire in dressing gowns and are cheerfully oblivious of time differences occasioned by longitude. "He's silly, he said good morning" and similar comments are not infrequent.

It is a great game for the blind children each Monday night during the school term. A VK5AWT transmitter used to be the supervisor of the operator rostered for the night.

The most usual call from VK5JAVI is "CQ DX 20W" and the wall testifies to the results. Using a long wire in place of a beam aerial may not be the best nor yet the final arrangement for this station, but there are verifications of contacts with LA4A, ZM1, UU2W, UU2W, HLR to name a few, and when bedtime comes round—that it for another week.

Not all activity on Mondays is centred on Amateur Radio, however, and in another room may be found Mr. J. A. Paterson's latest creation for the entertainment of those of the children who are not restricted. Vision blindness doesn't necessarily mean complete loss of sight—a shooting gallery using a light beam to aim and register a "hit". Mr. Paterson is an electronics wizard employed by the S.E.C. and obviously enjoys his night with the children.

We watched while a young sharpshooter pressed the trigger of the "rifle" and manoeuvred the resulting spot of light on the target area. The diameter of the spot was generous compared with the eyes of the visually impaired, but no less accurate with poor vision. To make it more of a challenge, a finite time of light-beam duration encourages the marksman to make up his mind quickly or else he will be left in the dark with no ammunition.

Matron Dunnell is grateful for the interest displayed by W.I.A. members and others who make it possible for her small charges to derive pleasure and some measure of education during their leisure time. Incidentally, the lives the children lead are seldom dull and they can favourably impress visitors with the diversity of their achievements.

How about it? Any more bright ideas?

(Article from the Suptd. of Public Relations, Royal Victorian Institute for the Blind, 557 St Kilda Road, Melbourne, Vic., 3004.)

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SILENT KEYS

It is with deep regret that we record the passing of—

VK2ACT—W. L. Brook.

VK2AWD—A. W. Dever.

VK4CM—T. M. B. Elliott.

VK6WS—W. Schofield.

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ART Receiver with P/S, no coil boxes, \$38. Field Strength and Noise Meter (to 160 MHz), \$2. Fv. DC-260V AC, \$20. No. 19 Set, \$10. 14 Lever Key Switches, with indicator lamps in lampholder finish panel, new, \$10. W. H. Walker, 23 Ashmore Rd., Forest Hill, Vic., 3131.

ATTENTION librarians and others. Pre-war issues of "QST" for sale, 1925, Aug. and Dec.; 1927, Jan. July, Aug., Sept., Oct., Nov., Dec.; 1928; Jan. and a full run from April 1928 to Nov. 1929. Some very odd items, such as the first ever printed QSL card, What offers? G. B. Eagless (ex VK5GR), 424 Goodwood Rd., Cumberland Park, S.A. 5041.

BARGAIN (see August Hamads). K.W. Vespa skates, 100-100-100 mm. 90°. PEP SSB/AM/CW 1/2W PSU \$150 or best offer. \$150. 160-100-100 mm. Mobile Whip, \$20. Leon VOX/PIT two-stage Pre-Amp. Table Mic, \$15. VK7MT, 73 Westbury Rd., S. Launceston, Tas., 7250. Tel. 44-1392.

COLLINS KWS-1 and 78A-3 combination for sale as am reluctantly leaving this great country. Extra valves and filters included. A beautiful SSB signal and winner of many DX Contests. \$650 for the pair. Jack Phillips VK1HG, Phone Canberra 95-6387.

FOR SALE: As new Trio TS510 Transceiver plus matching 240V AC mains power supply and matching remote VFO SD. All facilities provided and 160w. p.e.p. Suitable for VHF Transverter operation also. This is the latest Transceiver from Trio. Mic and feed, \$100. Power supply, \$100. Handwired alignment tool, spare parts, and a set of valves included. Priced for quick sale, \$450. Phone or telegram Melbourne (03) 20-4329, VK3ZXX.

FOR SALE: Estate late Jack Small, VK5EF. Homebrew single-band SSB Transceiver, 7 MHz. Complete, all tubes. Pye filter, etc. Tx pair 6146s. Power Supply and speaker in separate unit, \$50. Contact: Bill Moore, VK2HZ, 29 Pitt St., Springwood, N.S.W., 2777. Phone Springwood 51-1724. Engadine, N.S.W., 2233.

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FOR SALE: Galaxy III. Transceiver, ex late VK2MWW. SSB 20-40-80, good order with handbook, mic. (Ronneut insert, D104 case), \$160. AC Power Supply local product. \$50. Power supply separately. Also Class C Transistor, 240V. AC. \$10. VK2HC, "Amaroo," Quirindi, N.S.W., 2343.

FOR SALE: New bench PSU. 3.15v. continuously variable. \$20. SSB protection. \$22. Nearly complete. Pye 50W FM 2 m. multi-mode Base Station, incl. Tx Xtal for Chans. A, B, C, S25. Base loaded. Whip, readily adjustable for all h.f. bands, \$15. Eddystone Bug, \$12. Pye 9 MHz. SSB Xtal Filter included. Various matching components, USSR, E10 Xtal, \$23. 6-pole SSB Xtal Filter, 1.4 MHz., \$15. Eddystone 003 Dial Assy., \$15. Oly. 6146, T121 Valves. VFO 7.8-8.1 MHz., complete with 8 xtal, gives 9 MHz. op. on all HF bands, \$30. 160W. relay, Xtal controlled 160 m. ix. \$10. PTT relay, Circuits, 1030 kHz xtal, \$23. Large assortment transformers, PCBs, Relays, etc. VK3BV, 11 Catherine Pde., Frankston, Vic., 3199. Phone 763-1408.

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FOR SALE: Shifting OTL, Yaesu FT101 with matching speaker and separate VFO, all recent models, \$630. 140W. 1.6 to 10 MHz. Transistor Section. Matching Mast for removal, \$65. MR290 2 m. 160-100-100 m. 3x2. Tx/Bal. with AC Power Supply, no Xtal, \$35. HRO dial and gear box, \$15. VK3IZ, 35 Ingrams Rd., Research, Vic. Phone 437-1811.

FOR SALE: Star S550 Communications Receiver, covers 160-6 metre Ham bands. Instruction manual and speaker, 240 volt in-built power supply. Mint condition. \$150. J. P. Meyer, P.O. Box 181, Mundubbera, Qld., 4626.

FOR SALE: Yaesu FTDX400 with FVDX400 remote VFO. Condition as new, \$375. no offers. VK2WHD, 44 Airlie Cres., Lane Cove, N.S.W., 2606. Phone 42-6000.

FOR SALE: Yaesu Musem FL200B SSB Transmitter, outstanding signal, \$200. O. Sass, 12 Ruswell Ave., Warners Bay, N.S.W., 2282.

RX-TX Banks, 28-80-10 mx, 280 speaker, Q multiplier, peak/notch, 2A24 crystal calibrator, \$240. Hornmarlins HK30, 160-100-100 m. crystal filter, SSB/CW 140W. 120-100-100 m. 3x2. Tx/Bal. with 160W. relay, \$170. Bal. with 117V transformer for \$340. VK3AKZ, 6 Duffryn Pl., Toorak, Melb., Vic., 3142.

SELL: Class C Wavemeter, complete, \$20. Crystal Calibrator, No. 10, \$12. 3-inch CRO, \$20. Two 100W. 1.6 to 10 MHz. transistors, \$10. AC/DC, no a scope, \$50. Iot. Aallen Filter, \$58. Gelato VFO with tubes, \$4. Also Photo Developing Tanks. Phone Sydney 47-3089.

SELL: Swan 500C, new, AGC, ALC, latest 16-pole filter, crossover, with power supply, all mint condition. FTF2 2 metre FM Yaesu Transceiver with AC/DC supply, brand new. Phone A.H. 20-6135, Eus. 24-1233 (Melbourne).

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WANTED: Circuit diagram, Handbooks or any information on Marconi Type CR150/3 Receiver. Will copy and return if desired. Bill Verrall, VK5WV, 7 Lilac Ave., Flinders Park, S.A., 5025.

WANTED: Class 512-1-23 Receiver, Johnson Valiant Transmitter, CRO 5 MHz. bandwidth suitable TV servicing. Also general coverage Receiver, suit SWL such as Eddystone 640, S750, S800, 680X, Halliwell, Hornbeam, Alford, etc. A. C. Hawk, VK3HJ, Box 35, Dimboola, Vic., 3447.

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WANTED: Drake 2B Receiver in good condition, preferably with O Multiplier. Also keyer paddle, normal or squeeze. Write giving full details and calling time. New Davis, VK1DKA, 32 Kalgoorlie Cres., Fisher, A.C.T., 2511. Phone Canberra (062) 63-3664, business hours.

WANTED: Murphy British Naval VLF Receiver or similar type transmitter, 100W. 10 kHz. or lower. R. F. Fisher, VK3BAO, 241 Royal Pde., Parkville, Vic., 3052. Phone (business hours) 340-5931.



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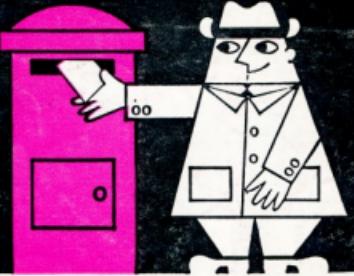
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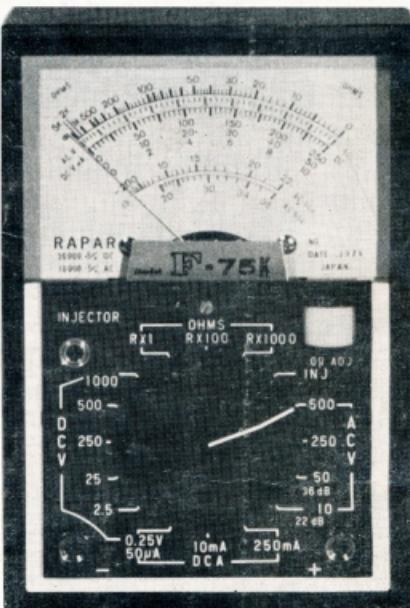
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